

BRAT  
4.0.0-beta

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## Contents

<b>1</b>	<b>Module Index</b>	<b>1</b>
1.1	Modules . . . . .	1
<b>2</b>	<b>Namespace Index</b>	<b>1</b>
2.1	Namespace List . . . . .	1
<b>3</b>	<b>Class Index</b>	<b>1</b>
3.1	Class Hierarchy . . . . .	1
<b>4</b>	<b>Class Index</b>	<b>5</b>
4.1	Class List . . . . .	5
<b>5</b>	<b>File Index</b>	<b>8</b>
5.1	File List . . . . .	8
<b>6</b>	<b>Module Documentation</b>	<b>11</b>
6.1	Algorithms classes . . . . .	11
6.1.1	Detailed Description . . . . .	14
6.1.2	Function Documentation . . . . .	14
6.2	Tools . . . . .	17
6.2.1	Detailed Description . . . . .	26
6.2.2	Macro Definition Documentation . . . . .	26
6.2.3	Typedef Documentation . . . . .	27
6.2.4	Function Documentation . . . . .	27
6.2.5	Variable Documentation . . . . .	45
6.3	Criteria . . . . .	46
6.3.1	Detailed Description . . . . .	56
6.3.2	Function Documentation . . . . .	56
6.3.3	Variable Documentation . . . . .	62
6.4	Date conversion classes . . . . .	63
6.4.1	Detailed Description . . . . .	63
6.5	File services . . . . .	64
6.5.1	Detailed Description . . . . .	64
6.6	Parameters . . . . .	65
6.6.1	Detailed Description . . . . .	65
6.6.2	Function Documentation . . . . .	65
6.7	Date conversion C APIs . . . . .	67
6.7.1	Detailed Description . . . . .	67
6.7.2	Function Documentation . . . . .	67
6.8	C API for reading data . . . . .	75

6.8.1	Detailed Description . . . . .	75
6.8.2	Function Documentation . . . . .	75
6.9	Date conversion Fortran APIs . . . . .	77
6.9.1	Detailed Description . . . . .	77
6.9.2	Function Documentation . . . . .	77
6.10	Fortran API for reading data . . . . .	89
6.10.1	Detailed Description . . . . .	89
6.10.2	Function Documentation . . . . .	89
<b>7</b>	<b>Namespace Documentation</b>	<b>91</b>
7.1	brathl Namespace Reference . . . . .	91
7.1.1	Detailed Description . . . . .	95
7.1.2	Typedef Documentation . . . . .	95
7.1.3	Variable Documentation . . . . .	96
<b>8</b>	<b>Class Documentation</b>	<b>98</b>
8.1	_structDateDSM Struct Reference . . . . .	98
8.1.1	Detailed Description . . . . .	98
8.1.2	Member Data Documentation . . . . .	98
8.2	_structDateJulian Struct Reference . . . . .	99
8.2.1	Detailed Description . . . . .	99
8.2.2	Member Data Documentation . . . . .	99
8.3	_structDateSecond Struct Reference . . . . .	100
8.3.1	Detailed Description . . . . .	100
8.3.2	Member Data Documentation . . . . .	100
8.4	_structDateYMDHMSM Struct Reference . . . . .	100
8.4.1	Detailed Description . . . . .	100
8.5	brathl::CBratAlgoFilterGaussian1D Class Reference . . . . .	101
8.5.1	Detailed Description . . . . .	101
8.5.2	Constructor & Destructor Documentation . . . . .	101
8.5.3	Member Function Documentation . . . . .	101
8.6	brathl::CBratAlgoFilterGaussian2D Class Reference . . . . .	102
8.6.1	Detailed Description . . . . .	103
8.6.2	Constructor & Destructor Documentation . . . . .	103
8.6.3	Member Function Documentation . . . . .	103
8.7	brathl::CBratAlgoFilterLanczos1D Class Reference . . . . .	104
8.7.1	Detailed Description . . . . .	105
8.7.2	Constructor & Destructor Documentation . . . . .	105
8.7.3	Member Function Documentation . . . . .	105
8.8	brathl::CBratAlgoFilterLanczos2D Class Reference . . . . .	106
8.8.1	Detailed Description . . . . .	106

8.8.2	Constructor & Destructor Documentation . . . . .	106
8.8.3	Member Function Documentation . . . . .	107
8.9	bratl::CBratAlgoFilterLoess1D Class Reference . . . . .	107
8.9.1	Detailed Description . . . . .	109
8.9.2	Constructor & Destructor Documentation . . . . .	109
8.9.3	Member Function Documentation . . . . .	109
8.10	bratl::CBratAlgoFilterLoess2D Class Reference . . . . .	111
8.10.1	Detailed Description . . . . .	112
8.10.2	Constructor & Destructor Documentation . . . . .	112
8.10.3	Member Function Documentation . . . . .	112
8.11	bratl::CBratAlgoFilterMedian1D Class Reference . . . . .	114
8.11.1	Detailed Description . . . . .	115
8.11.2	Constructor & Destructor Documentation . . . . .	115
8.11.3	Member Function Documentation . . . . .	115
8.12	bratl::CBratAlgoFilterMedian2D Class Reference . . . . .	117
8.12.1	Detailed Description . . . . .	118
8.12.2	Constructor & Destructor Documentation . . . . .	118
8.12.3	Member Function Documentation . . . . .	118
8.13	bratl::CBratAlgorithmBase Class Reference . . . . .	120
8.13.1	Detailed Description . . . . .	123
8.13.2	Constructor & Destructor Documentation . . . . .	123
8.13.3	Member Function Documentation . . . . .	123
8.14	bratl::CBratAlgorithmGeosVel Class Reference . . . . .	125
8.14.1	Detailed Description . . . . .	127
8.14.2	Constructor & Destructor Documentation . . . . .	127
8.14.3	Member Function Documentation . . . . .	128
8.15	bratl::CBratAlgorithmGeosVelAtp Class Reference . . . . .	128
8.15.1	Detailed Description . . . . .	130
8.15.2	Constructor & Destructor Documentation . . . . .	130
8.15.3	Member Function Documentation . . . . .	130
8.16	bratl::CBratAlgorithmGeosVelGrid Class Reference . . . . .	132
8.16.1	Detailed Description . . . . .	135
8.17	bratl::CBratAlgorithmGeosVelGridU Class Reference . . . . .	135
8.17.1	Detailed Description . . . . .	136
8.18	bratl::CBratAlgorithmGeosVelGridV Class Reference . . . . .	137
8.18.1	Detailed Description . . . . .	138
8.19	bratl::CCriteria Class Reference . . . . .	139
8.19.1	Detailed Description . . . . .	139
8.19.2	Member Enumeration Documentation . . . . .	140
8.19.3	Member Function Documentation . . . . .	140

8.20	brathl::CCriteriaCycle Class Reference . . . . .	140
8.20.1	Detailed Description . . . . .	142
8.20.2	Constructor & Destructor Documentation . . . . .	142
8.20.3	Member Function Documentation . . . . .	143
8.20.4	Member Data Documentation . . . . .	145
8.21	brathl::CCriteriaCycleInfo Class Reference . . . . .	145
8.21.1	Detailed Description . . . . .	147
8.22	brathl::CCriteriaDatetime Class Reference . . . . .	147
8.22.1	Detailed Description . . . . .	149
8.22.2	Constructor & Destructor Documentation . . . . .	149
8.22.3	Member Function Documentation . . . . .	150
8.22.4	Member Data Documentation . . . . .	152
8.23	brathl::CCriteriaDatetimeInfo Class Reference . . . . .	152
8.23.1	Detailed Description . . . . .	153
8.24	brathl::CCriteriaInfo Class Reference . . . . .	154
8.24.1	Detailed Description . . . . .	155
8.25	brathl::CCriteriaLatLon Class Reference . . . . .	155
8.25.1	Detailed Description . . . . .	157
8.25.2	Constructor & Destructor Documentation . . . . .	157
8.25.3	Member Function Documentation . . . . .	158
8.25.4	Member Data Documentation . . . . .	161
8.26	brathl::CCriteriaLatLonInfo Class Reference . . . . .	161
8.26.1	Detailed Description . . . . .	162
8.27	brathl::CCriteriaPass Class Reference . . . . .	162
8.27.1	Detailed Description . . . . .	164
8.28	brathl::CCriteriaPassInfo Class Reference . . . . .	164
8.28.1	Detailed Description . . . . .	165
8.29	brathl::CCriteriaPassInt Class Reference . . . . .	166
8.29.1	Detailed Description . . . . .	168
8.30	brathl::CCriteriaPassIntInfo Class Reference . . . . .	168
8.30.1	Detailed Description . . . . .	169
8.31	brathl::CCriteriaPassString Class Reference . . . . .	169
8.31.1	Detailed Description . . . . .	171
8.32	brathl::CCriteriaPassStringInfo Class Reference . . . . .	172
8.32.1	Detailed Description . . . . .	173
8.33	brathl::CDataSet Class Reference . . . . .	173
8.33.1	Detailed Description . . . . .	174
8.33.2	Member Function Documentation . . . . .	175
8.34	brathl::CDate Class Reference . . . . .	175
8.34.1	Detailed Description . . . . .	178

8.34.2	Constructor & Destructor Documentation . . . . .	178
8.34.3	Member Function Documentation . . . . .	179
8.34.4	Member Data Documentation . . . . .	191
8.35	bratl::CDatePeriod Class Reference . . . . .	192
8.35.1	Detailed Description . . . . .	193
8.35.2	Constructor & Destructor Documentation . . . . .	193
8.35.3	Member Function Documentation . . . . .	194
8.35.4	Member Data Documentation . . . . .	196
8.36	bratl::CDoubleMap Class Reference . . . . .	197
8.36.1	Detailed Description . . . . .	197
8.37	bratl::CDoublePtrArray Class Reference . . . . .	197
8.37.1	Detailed Description . . . . .	198
8.38	bratl::CDoublePtrDoubleMap Class Reference . . . . .	198
8.38.1	Detailed Description . . . . .	199
8.39	bratl::CExpressionValue Class Reference . . . . .	199
8.39.1	Detailed Description . . . . .	200
8.40	bratl::CExternalFilesAvisoGrid Class Reference . . . . .	201
8.40.1	Detailed Description . . . . .	202
8.40.2	Member Function Documentation . . . . .	202
8.41	bratl::CExternalFilesJason2 Class Reference . . . . .	202
8.41.1	Detailed Description . . . . .	203
8.42	bratl::CExternalFilesNetCDF Class Reference . . . . .	203
8.42.1	Detailed Description . . . . .	205
8.42.2	Member Function Documentation . . . . .	205
8.43	bratl::CField Class Reference . . . . .	205
8.43.1	Detailed Description . . . . .	210
8.43.2	Member Data Documentation . . . . .	210
8.44	bratl::CFieldArray Class Reference . . . . .	210
8.44.1	Detailed Description . . . . .	212
8.45	bratl::CFieldBasic Class Reference . . . . .	212
8.45.1	Detailed Description . . . . .	213
8.46	bratl::CFieldIndexData Class Reference . . . . .	214
8.46.1	Detailed Description . . . . .	216
8.47	bratl::CFieldNetCdf Class Reference . . . . .	216
8.47.1	Detailed Description . . . . .	219
8.47.2	Member Data Documentation . . . . .	220
8.48	bratl::CFieldNetCdfCF Class Reference . . . . .	221
8.48.1	Detailed Description . . . . .	222
8.49	bratl::CFieldNetCdfCFAttr Class Reference . . . . .	223
8.49.1	Detailed Description . . . . .	225

8.50	brathl::CFieldRecord Class Reference . . . . .	225
8.50.1	Detailed Description . . . . .	227
8.51	brathl::CFieldSet Class Reference . . . . .	227
8.51.1	Detailed Description . . . . .	229
8.52	brathl::CFieldSetArrayDbl Class Reference . . . . .	229
8.52.1	Detailed Description . . . . .	231
8.53	brathl::CFieldSetDbl Class Reference . . . . .	231
8.53.1	Detailed Description . . . . .	233
8.54	brathl::CFieldSetString Class Reference . . . . .	233
8.54.1	Detailed Description . . . . .	235
8.55	brathl::CFile Class Reference . . . . .	235
8.55.1	Detailed Description . . . . .	236
8.55.2	Member Enumeration Documentation . . . . .	237
8.55.3	Constructor & Destructor Documentation . . . . .	237
8.55.4	Member Function Documentation . . . . .	237
8.56	brathl::CFileParams Class Reference . . . . .	242
8.56.1	Detailed Description . . . . .	243
8.56.2	Constructor & Destructor Documentation . . . . .	243
8.56.3	Member Function Documentation . . . . .	244
8.56.4	Member Data Documentation . . . . .	244
8.57	brathl::CProduct::CInfo Class Reference . . . . .	245
8.57.1	Detailed Description . . . . .	245
8.58	brathl::CInternalFiles Class Reference . . . . .	245
8.58.1	Detailed Description . . . . .	247
8.59	brathl::CInternalFilesYFX Class Reference . . . . .	247
8.59.1	Detailed Description . . . . .	248
8.60	brathl::CInternalFilesZFX Class Reference . . . . .	248
8.60.1	Detailed Description . . . . .	250
8.61	brathl::CIntList Class Reference . . . . .	250
8.61.1	Detailed Description . . . . .	250
8.62	brathl::CIntMap Class Reference . . . . .	250
8.62.1	Detailed Description . . . . .	251
8.63	brathl::CField::CListField Class Reference . . . . .	251
8.63.1	Detailed Description . . . . .	252
8.63.2	Member Function Documentation . . . . .	252
8.64	brathl::CProduct::CListInfo Class Reference . . . . .	253
8.64.1	Detailed Description . . . . .	253
8.65	brathl::CMapParameter Class Reference . . . . .	254
8.65.1	Detailed Description . . . . .	254
8.66	brathl::CMapProduct Class Reference . . . . .	254

8.66.1 Detailed Description . . . . .	255
8.67 brathl::CMission Class Reference . . . . .	255
8.67.1 Detailed Description . . . . .	256
8.67.2 Constructor & Destructor Documentation . . . . .	257
8.67.3 Member Function Documentation . . . . .	257
8.67.4 Member Data Documentation . . . . .	259
8.68 brathl::CObArray Class Reference . . . . .	260
8.68.1 Detailed Description . . . . .	261
8.69 brathl::CObDoubleMap Class Reference . . . . .	261
8.69.1 Detailed Description . . . . .	262
8.70 brathl::CObIntMap Class Reference . . . . .	262
8.70.1 Detailed Description . . . . .	262
8.71 brathl::CObList Class Reference . . . . .	263
8.71.1 Detailed Description . . . . .	263
8.72 brathl::CObMap Class Reference . . . . .	264
8.72.1 Detailed Description . . . . .	264
8.73 brathl::CObStack Class Reference . . . . .	265
8.73.1 Detailed Description . . . . .	265
8.74 brathl::CParameter Class Reference . . . . .	265
8.74.1 Detailed Description . . . . .	266
8.74.2 Constructor & Destructor Documentation . . . . .	267
8.74.3 Member Function Documentation . . . . .	267
8.75 brathl::CProductAop Class Reference . . . . .	268
8.75.1 Detailed Description . . . . .	269
8.75.2 Constructor & Destructor Documentation . . . . .	269
8.76 brathl::CProductCryosat Class Reference . . . . .	269
8.76.1 Detailed Description . . . . .	270
8.76.2 Constructor & Destructor Documentation . . . . .	270
8.77 brathl::CProductEnvisat Class Reference . . . . .	270
8.77.1 Detailed Description . . . . .	271
8.77.2 Constructor & Destructor Documentation . . . . .	271
8.77.3 Member Function Documentation . . . . .	272
8.78 brathl::CProductErs Class Reference . . . . .	272
8.78.1 Detailed Description . . . . .	273
8.78.2 Constructor & Destructor Documentation . . . . .	274
8.78.3 Member Function Documentation . . . . .	274
8.79 brathl::CProductErsWAP Class Reference . . . . .	274
8.79.1 Detailed Description . . . . .	276
8.79.2 Constructor & Destructor Documentation . . . . .	276
8.79.3 Member Function Documentation . . . . .	276



8.80	brathl::CProductGfo Class Reference . . . . .	277
8.80.1	Detailed Description . . . . .	277
8.80.2	Constructor & Destructor Documentation . . . . .	277
8.80.3	Member Function Documentation . . . . .	278
8.81	brathl::CProductJason Class Reference . . . . .	278
8.81.1	Detailed Description . . . . .	279
8.81.2	Constructor & Destructor Documentation . . . . .	279
8.81.3	Member Function Documentation . . . . .	279
8.82	brathl::CProductJason2 Class Reference . . . . .	279
8.82.1	Detailed Description . . . . .	281
8.82.2	Constructor & Destructor Documentation . . . . .	281
8.83	brathl::CProductList Class Reference . . . . .	281
8.83.1	Detailed Description . . . . .	283
8.84	brathl::CProductNetCdf Class Reference . . . . .	283
8.84.1	Detailed Description . . . . .	287
8.84.2	Constructor & Destructor Documentation . . . . .	287
8.84.3	Member Data Documentation . . . . .	287
8.85	brathl::CProductNetCdfCF Class Reference . . . . .	287
8.85.1	Detailed Description . . . . .	289
8.85.2	Constructor & Destructor Documentation . . . . .	289
8.85.3	Member Data Documentation . . . . .	290
8.86	brathl::CProductPodaac Class Reference . . . . .	290
8.86.1	Detailed Description . . . . .	291
8.86.2	Constructor & Destructor Documentation . . . . .	291
8.87	brathl::CProductRads Class Reference . . . . .	291
8.87.1	Detailed Description . . . . .	292
8.87.2	Constructor & Destructor Documentation . . . . .	292
8.88	brathl::CProductReaper Class Reference . . . . .	292
8.88.1	Detailed Description . . . . .	294
8.88.2	Constructor & Destructor Documentation . . . . .	294
8.89	brathl::CProductRiverLake Class Reference . . . . .	294
8.89.1	Detailed Description . . . . .	295
8.89.2	Constructor & Destructor Documentation . . . . .	295
8.90	brathl::CProductTopex Class Reference . . . . .	295
8.90.1	Detailed Description . . . . .	296
8.90.2	Constructor & Destructor Documentation . . . . .	296
8.90.3	Member Function Documentation . . . . .	297
8.90.4	Member Data Documentation . . . . .	297
8.91	brathl::CProductTopexSDR Class Reference . . . . .	297
8.91.1	Detailed Description . . . . .	299

8.91.2	Constructor & Destructor Documentation . . . . .	299
8.91.3	Member Function Documentation . . . . .	299
8.92	brathl::CPtrMap Class Reference . . . . .	299
8.92.1	Detailed Description . . . . .	300
8.93	brathl::CRecord Class Reference . . . . .	300
8.93.1	Detailed Description . . . . .	301
8.94	brathl::CRecordSet Class Reference . . . . .	302
8.94.1	Detailed Description . . . . .	303
8.95	brathl::CRegisteredPass Class Reference . . . . .	303
8.95.1	Detailed Description . . . . .	303
8.96	brathl::CStringList Class Reference . . . . .	304
8.96.1	Detailed Description . . . . .	305
8.97	brathl::CStringMap Class Reference . . . . .	305
8.97.1	Detailed Description . . . . .	305
8.98	brathl::CTools Class Reference . . . . .	306
8.98.1	Detailed Description . . . . .	309
8.98.2	Member Function Documentation . . . . .	309
8.99	brathl::CTreeField Class Reference . . . . .	330
8.99.1	Detailed Description . . . . .	330
8.100	brathl::CUIntMap Class Reference . . . . .	331
8.100.1	Detailed Description . . . . .	331
8.101	PyAlgo Class Reference . . . . .	331
8.101.1	Detailed Description . . . . .	333
8.101.2	Constructor & Destructor Documentation . . . . .	333
8.101.3	Member Function Documentation . . . . .	333
8.102	PythonEngine Class Reference . . . . .	335
8.102.1	Detailed Description . . . . .	335
<b>9</b>	<b>File Documentation</b>	<b>336</b>
9.1	brathl.h File Reference . . . . .	336
9.1.1	Detailed Description . . . . .	337
9.1.2	Macro Definition Documentation . . . . .	337
9.1.3	Typedef Documentation . . . . .	338
9.1.4	Enumeration Type Documentation . . . . .	338
9.1.5	Variable Documentation . . . . .	338
9.2	brathl_fortran.c File Reference . . . . .	339
9.2.1	Detailed Description . . . . .	340
9.3	brathlc.h File Reference . . . . .	340
9.3.1	Detailed Description . . . . .	342
9.3.2	Function Documentation . . . . .	342

9.3.3	Variable Documentation . . . . .	342
9.4	MapParameter.h File Reference . . . . .	342
9.4.1	Detailed Description . . . . .	343

## 1 Module Index

### 1.1 Modules

Here is a list of all modules:

<b>Algorithms classes</b>	<b>11</b>
<b>Tools</b>	<b>17</b>
<b>Criteria</b>	<b>46</b>
<b>Date conversion classes</b>	<b>63</b>
<b>File services</b>	<b>64</b>
<b>Parameters</b>	<b>65</b>
<b>Date conversion C APIs</b>	<b>67</b>
<b>C API for reading data</b>	<b>75</b>
<b>Date conversion Fortran APIs</b>	<b>77</b>
<b>Fortran API for reading data</b>	<b>89</b>

## 2 Namespace Index

### 2.1 Namespace List

Here is a list of all documented namespaces with brief descriptions:

<b>brathl</b>	<b>91</b>
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## 3 Class Index

### 3.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

<b>_structDateDSM</b>	<b>98</b>
<b>_structDateJulian</b>	<b>99</b>
<b>_structDateSecond</b>	<b>100</b>
<b>_structDateYMDHMSM</b>	<b>100</b>
<b>brathl::CBratAlgoFilterGaussian1D</b>	<b>101</b>

brathl::CBratAlgoFilterGaussian2D	102
brathl::CBratAlgoFilterLanczos1D	104
brathl::CBratAlgoFilterLanczos2D	106
brathl::CBratAlgoFilterLoess1D	107
brathl::CBratAlgoFilterLoess2D	111
brathl::CBratAlgoFilterMedian1D	114
brathl::CBratAlgoFilterMedian2D	117
brathl::CBratAlgorithmBase	120
brathl::CBratAlgorithmGeosVel	125
brathl::CBratAlgorithmGeosVelAtp	128
brathl::CBratAlgorithmGeosVelGrid	132
brathl::CBratAlgorithmGeosVelGridU	135
brathl::CBratAlgorithmGeosVelGridV	137
PyAlgo	331
brathl::CCriteria	139
brathl::CCriteriaCycle	140
brathl::CCriteriaDatetime	147
brathl::CCriteriaLatLon	155
brathl::CCriteriaPass	162
brathl::CCriteriaPassInt	166
brathl::CCriteriaPassString	169
brathl::CCriterialInfo	154
brathl::CCriteriaCycleInfo	145
brathl::CCriteriaDatetimeInfo	152
brathl::CCriteriaLatLonInfo	161
brathl::CCriteriaPassInfo	164
brathl::CCriteriaPassIntInfo	168
brathl::CCriteriaPassStringInfo	172
brathl::CDate	175
brathl::CDatePeriod	192
brathl::CDoubleMap	197
brathl::CDoublePtrArray	197

<b>brathl::CDoublePtrDoubleMap</b>	<b>198</b>
<b>brathl::CExpressionValue</b>	<b>199</b>
<b>brathl::CExternalFilesAvisoGrid</b>	<b>201</b>
<b>brathl::CExternalFilesJason2</b>	<b>202</b>
<b>brathl::CExternalFilesNetCDF</b>	<b>203</b>
<b>brathl::CField</b>	<b>205</b>
<b>brathl::CFieldArray</b>	<b>210</b>
<b>brathl::CFieldRecord</b>	<b>225</b>
<b>brathl::CFieldBasic</b>	<b>212</b>
<b>brathl::CFieldIndexData</b>	<b>214</b>
<b>brathl::CFieldNetCdf</b>	<b>216</b>
<b>brathl::CFieldNetCdfCF</b>	<b>221</b>
<b>brathl::CFieldNetCdfCFAttr</b>	<b>223</b>
<b>brathl::CFieldSet</b>	<b>227</b>
<b>brathl::CFieldSetArrayDbl</b>	<b>229</b>
<b>brathl::CFieldSetDbl</b>	<b>231</b>
<b>brathl::CFieldSetString</b>	<b>233</b>
<b>brathl::CFile</b>	<b>235</b>
<b>brathl::CFileParams</b>	<b>242</b>
<b>brathl::CProduct::CInfo</b>	<b>245</b>
<b>brathl::CInternalFiles</b>	<b>245</b>
<b>brathl::CInternalFilesYFX</b>	<b>247</b>
<b>brathl::CInternalFilesZFX</b>	<b>248</b>
<b>brathl::CIntList</b>	<b>250</b>
<b>brathl::CIntMap</b>	<b>250</b>
<b>brathl::CMapParameter</b>	<b>254</b>
<b>brathl::CMission</b>	<b>255</b>
<b>brathl::CObArray</b>	<b>260</b>
<b>brathl::CDataSet</b>	<b>173</b>
<b>brathl::CObDoubleMap</b>	<b>261</b>
<b>brathl::CObIntMap</b>	<b>262</b>
<b>brathl::CObList</b>	<b>263</b>

brathl::CField::CListField	251
brathl::CProduct::CListInfo	253
brathl::CObMap	264
brathl::CMapProduct	254
brathl::CRecordSet	302
brathl::CObStack	265
brathl::CParameter	265
brathl::CProductAop	268
brathl::CProductCryosat	269
brathl::CProductEnvisat	270
brathl::CProductErs	272
brathl::CProductErsWAP	274
brathl::CProductGfo	277
brathl::CProductJason	278
brathl::CProductNetCdf	283
brathl::CProductNetCdfCF	287
brathl::CProductJason2	279
brathl::CProductReaper	292
brathl::CProductPodaac	290
brathl::CProductRads	291
brathl::CProductRiverLake	294
brathl::CProductTopex	295
brathl::CProductTopexSDR	297
brathl::CPtrMap	299
brathl::CRecord	300
brathl::CRegisteredPass	303
brathl::CStringList	304
brathl::CProductList	281
brathl::CStringMap	305
brathl::CTools	306
brathl::CTreeField	330
brathl::CUIntMap	331

<b>PythonEngine</b>	<b>335</b>
---------------------	------------

## 4 Class Index

### 4.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

<b>_structDateDSM</b>	<b>98</b>
<b>_structDateJulian</b>	<b>99</b>
<b>_structDateSecond</b>	<b>100</b>
<b>_structDateYMDHMSM</b>	<b>100</b>
<b>bratl::CBratAlgoFilterGaussian1D</b>	<b>101</b>
<b>bratl::CBratAlgoFilterGaussian2D</b>	<b>102</b>
<b>bratl::CBratAlgoFilterLanczos1D</b>	<b>104</b>
<b>bratl::CBratAlgoFilterLanczos2D</b>	<b>106</b>
<b>bratl::CBratAlgoFilterLoess1D</b>	<b>107</b>
<b>bratl::CBratAlgoFilterLoess2D</b>	<b>111</b>
<b>bratl::CBratAlgoFilterMedian1D</b>	<b>114</b>
<b>bratl::CBratAlgoFilterMedian2D</b>	<b>117</b>
<b>bratl::CBratAlgorithmBase</b>	<b>120</b>
<b>bratl::CBratAlgorithmGeosVel</b>	<b>125</b>
<b>bratl::CBratAlgorithmGeosVelAtp</b>	<b>128</b>
<b>bratl::CBratAlgorithmGeosVelGrid</b>	<b>132</b>
<b>bratl::CBratAlgorithmGeosVelGridU</b>	<b>135</b>
<b>bratl::CBratAlgorithmGeosVelGridV</b>	<b>137</b>
<b>bratl::CCriteria</b>	<b>139</b>
<b>bratl::CCriteriaCycle</b>	<b>140</b>
<b>bratl::CCriteriaCycleInfo</b>	<b>145</b>
<b>bratl::CCriteriaDatetime</b>	<b>147</b>
<b>bratl::CCriteriaDatetimeInfo</b>	<b>152</b>
<b>bratl::CCriterialInfo</b>	<b>154</b>
<b>bratl::CCriteriaLatLon</b>	<b>155</b>
<b>bratl::CCriteriaLatLonInfo</b>	<b>161</b>
<b>bratl::CCriteriaPass</b>	<b>162</b>

<b>brathl::CCriteriaPassInfo</b>	<b>164</b>
<b>brathl::CCriteriaPassInt</b>	<b>166</b>
<b>brathl::CCriteriaPassIntInfo</b>	<b>168</b>
<b>brathl::CCriteriaPassString</b>	<b>169</b>
<b>brathl::CCriteriaPassStringInfo</b>	<b>172</b>
<b>brathl::CDataSet</b>	<b>173</b>
<b>brathl::CDate</b>	<b>175</b>
<b>brathl::CDatePeriod</b>	<b>192</b>
<b>brathl::CDoubleMap</b>	<b>197</b>
<b>brathl::CDoublePtrArray</b>	<b>197</b>
<b>brathl::CDoublePtrDoubleMap</b>	<b>198</b>
<b>brathl::CExpressionValue</b>	<b>199</b>
<b>brathl::CExternalFilesAvisoGrid</b>	<b>201</b>
<b>brathl::CExternalFilesJason2</b>	<b>202</b>
<b>brathl::CExternalFilesNetCDF</b>	<b>203</b>
<b>brathl::CField</b>	<b>205</b>
<b>brathl::CFieldArray</b>	<b>210</b>
<b>brathl::CFieldBasic</b>	<b>212</b>
<b>brathl::CFieldIndexData</b>	<b>214</b>
<b>brathl::CFieldNetCdf</b>	<b>216</b>
<b>brathl::CFieldNetCdfCF</b>	<b>221</b>
<b>brathl::CFieldNetCdfCFAttr</b>	<b>223</b>
<b>brathl::CFieldRecord</b>	<b>225</b>
<b>brathl::CFieldSet</b>	<b>227</b>
<b>brathl::CFieldSetArrayDbI</b>	<b>229</b>
<b>brathl::CFieldSetDbI</b>	<b>231</b>
<b>brathl::CFieldSetString</b>	<b>233</b>
<b>brathl::CFile</b>	<b>235</b>
<b>brathl::CFileParams</b>	<b>242</b>
<b>brathl::CProduct::CInfo</b>	<b>245</b>
<b>brathl::CInternalFiles</b>	<b>245</b>
<b>brathl::CInternalFilesYFX</b>	<b>247</b>



<b>brathl::CInternalFilesZFX</b>	<b>248</b>
<b>brathl::CIntList</b>	<b>250</b>
<b>brathl::CIntMap</b>	<b>250</b>
<b>brathl::CField::CListField</b>	<b>251</b>
<b>brathl::CProduct::CListInfo</b>	<b>253</b>
<b>brathl::CMapParameter</b>	<b>254</b>
<b>brathl::CMapProduct</b>	<b>254</b>
<b>brathl::CMission</b>	<b>255</b>
<b>brathl::CObArray</b>	<b>260</b>
<b>brathl::CObDoubleMap</b>	<b>261</b>
<b>brathl::CObIntMap</b>	<b>262</b>
<b>brathl::CObList</b>	<b>263</b>
<b>brathl::CObMap</b>	<b>264</b>
<b>brathl::CObStack</b>	<b>265</b>
<b>brathl::CParameter</b>	<b>265</b>
<b>brathl::CProductAop</b>	<b>268</b>
<b>brathl::CProductCryosat</b>	<b>269</b>
<b>brathl::CProductEnvisat</b>	<b>270</b>
<b>brathl::CProductErs</b>	<b>272</b>
<b>brathl::CProductErsWAP</b>	<b>274</b>
<b>brathl::CProductGfo</b>	<b>277</b>
<b>brathl::CProductJason</b>	<b>278</b>
<b>brathl::CProductJason2</b>	<b>279</b>
<b>brathl::CProductList</b>	<b>281</b>
<b>brathl::CProductNetCdf</b>	<b>283</b>
<b>brathl::CProductNetCdfCF</b>	<b>287</b>
<b>brathl::CProductPodaac</b>	<b>290</b>
<b>brathl::CProductRads</b>	<b>291</b>
<b>brathl::CProductReaper</b>	<b>292</b>
<b>brathl::CProductRiverLake</b>	<b>294</b>
<b>brathl::CProductTopex</b>	<b>295</b>
<b>brathl::CProductTopexSDR</b>	<b>297</b>

<b>brathl::CPtrMap</b>	<b>299</b>
<b>brathl::CRecord</b>	<b>300</b>
<b>brathl::CRecordSet</b>	<b>302</b>
<b>brathl::CRegisteredPass</b>	<b>303</b>
<b>brathl::CStringList</b>	<b>304</b>
<b>brathl::CStringMap</b>	<b>305</b>
<b>brathl::CTools</b>	<b>306</b>
<b>brathl::CTreeField</b>	<b>330</b>
<b>brathl::CUIntMap</b>	<b>331</b>
<b>PyAlgo</b>	
Definition of the object to hold each Python Algorithm and respective variables/methods	<b>331</b>
<b>PythonEngine</b>	
Definition of the object to hold the Python Interpreter and respective methods	<b>335</b>

## 5 File Index

### 5.1 File List

Here is a list of all documented files with brief descriptions:

<b>Aliases.h</b>	<b>??</b>
<b>AliasesDictionary.h</b>	<b>??</b>
<b>argtable2.h</b>	<b>??</b>
<b>BratAlgoFilter.h</b>	<b>??</b>
<b>BratAlgoFilterGaussian.h</b>	<b>??</b>
<b>BratAlgoFilterGaussian1D.h</b>	<b>??</b>
<b>BratAlgoFilterGaussian2D.h</b>	<b>??</b>
<b>BratAlgoFilterKernel.h</b>	<b>??</b>
<b>BratAlgoFilterLanczos.h</b>	<b>??</b>
<b>BratAlgoFilterLanczos1D.h</b>	<b>??</b>
<b>BratAlgoFilterLanczos2D.h</b>	<b>??</b>
<b>BratAlgoFilterLoess.h</b>	<b>??</b>
<b>BratAlgoFilterLoess1D.h</b>	<b>??</b>
<b>BratAlgoFilterLoess2D.h</b>	<b>??</b>
<b>BratAlgoFilterMedian.h</b>	<b>??</b>

BratAlgoFilterMedian1D.h	??
BratAlgoFilterMedian2D.h	??
BratAlgorithmBase.h	??
BratAlgorithmGeosVel.h	??
BratAlgorithmGeosVelAtp.h	??
BratAlgorithmGeosVelGrid.h	??
BratEmbeddedPythonProcess.h	??
brathl.h	336
brathl_fortran.c	339
brathl_fortran.h	??
brathlc.h	340
BratObject.h	??
BratProcess.h	??
BratProcessExportAscii.h	??
BratProcessStats.h	??
BratProcessYFX.h	??
BratProcessZFX.h	??
CallBack.h	??
Criteria.h	??
CriteriaCycle.h	??
CriteriaDatetime.h	??
CriterialInfo.h	??
CriteriaLatLon.h	??
CriteriaPass.h	??
Date.h	??
DatePeriod.h	??
deelx.h	??
Expression.h	??
ExternalFiles.h	??
ExternalFilesATP.h	??
ExternalFilesAvisoGrid.h	??
ExternalFilesFactory.h	??

ExternalFilesJason2.h	??
ExternalFilesNetCDF.h	??
Field.h	??
File.h	??
FileParams.h	??
getopt.h	??
InternalFiles.h	??
InternalFilesFactory.h	??
InternalFilesYFX.h	??
InternalFilesZFX.h	??
LatLonPoint.h	??
LatLonRect.h	??
List.h	??
MapParameter.h	342
Mission.h	??
NetCDFFiles.h	??
ObjectTree.h	??
Parameter.h	??
ParametersDictionary.h	??
pragmalocation.h	??
ProcessCommonTools.h	??
Product.h	??
ProductAop.h	??
ProductCryosat.h	??
ProductEnvisat.h	??
ProductErs.h	??
ProductErsWAP.h	??
ProductGfo.h	??
ProductJason.h	??
ProductJason2.h	??
ProductNetCdf.h	??
ProductNetCdfCF.h	??

<b>ProductPodaac.h</b>	??
<b>ProductRads.h</b>	??
<b>ProductReaper.h</b>	??
<b>ProductRiverLake.h</b>	??
<b>ProductTopex.h</b>	??
<b>ProductTopexSDR.h</b>	??
<b>PythonEngine.hpp</b>	??
<b>RunPythonAlgorithm.hpp</b>	??
<b>Tools.h</b>	??
<b>TreeField.h</b>	??
<b>Unit.h</b>	??
<b>Win32MemLeaksAccurate.h</b>	??
<b>Xml.h</b>	??

## 6 Module Documentation

### 6.1 Algorithms classes

#### Classes

- class **bratl::CBratAlgoFilterGaussian1D**
- class **bratl::CBratAlgoFilterGaussian2D**
- class **bratl::CBratAlgoFilterLanczos1D**
- class **bratl::CBratAlgoFilterLanczos2D**
- class **bratl::CBratAlgoFilterLoess1D**
- class **bratl::CBratAlgoFilterLoess2D**
- class **bratl::CBratAlgoFilterMedian1D**
- class **bratl::CBratAlgoFilterMedian2D**
- class **bratl::CBratAlgorithmBase**
- class **bratl::CBratAlgorithmGeosVel**
- class **bratl::CBratAlgorithmGeosVelAtp**
- class **bratl::CBratAlgorithmGeosVelGrid**
- class **bratl::CBratAlgorithmGeosVelGridU**
- class **bratl::CBratAlgorithmGeosVelGridV**

#### Macros

- **#define AUTO\_REGISTER\_BASE(base) CBratAlgorithmBaseRegistration \_base\_registration\_ ## base(new base\_creator(&base\_factory<base>));**

## Typedefs

- typedef std::map< std::string,  
    **CBratAlgorithmBase** \* > **brathl::mapbratalgorithmbase**
- typedef std::vector  
    < **CBratAlgorithmBase** \* > **brathl::vectorbratalgorithmbase**

## Functions

- template<class T >  
    **CBratAlgorithmBase** \* **brathl::base\_factory** ()
- **brathl::CBratAlgorithmGeosVelGrid::CBratAlgorithmGeosVelGrid** ()
- **brathl::CBratAlgorithmGeosVelGrid::CBratAlgorithmGeosVelGrid** (const **CBratAlgorithmGeosVelGrid** &copy)
- **brathl::CBratAlgorithmGeosVelGridU::CBratAlgorithmGeosVelGridU** ()
- **brathl::CBratAlgorithmGeosVelGridU::CBratAlgorithmGeosVelGridU** (const **CBratAlgorithmGeosVelGridU** &copy)
- **brathl::CBratAlgorithmGeosVelGridV::CBratAlgorithmGeosVelGridV** ()
- **brathl::CBratAlgorithmGeosVelGridV::CBratAlgorithmGeosVelGridV** (const **CBratAlgorithmGeosVelGridV** &copy)
- void **brathl::CBratAlgorithmGeosVelGrid::CheckEquatorLimit** ()
- virtual void **brathl::CBratAlgorithmGeosVelGrid::CheckInputParams** (CVectorBratAlgorithmParam &args) override
- void **brathl::CBratAlgorithmGeosVelGrid::CheckLatLonExpression** (uint32\_t index)
- void **brathl::CBratAlgorithmGeosVelGrid::CheckProduct** ()
- void **brathl::CBratAlgorithmGeosVelGrid::CheckVarExpression** (uint32\_t index)
- double **brathl::CBratAlgorithmGeosVelGrid::ComputeMean** ()
- double **brathl::CBratAlgorithmGeosVelGrid::ComputeSingle** ()
- virtual double **brathl::CBratAlgorithmGeosVelGrid::ComputeVelocity** ()=0
- double **brathl::CBratAlgorithmGeosVelGridU::ComputeVelocity** () override
- double **brathl::CBratAlgorithmGeosVelGridV::ComputeVelocity** () override
- virtual void **brathl::CBratAlgorithmGeosVelGrid::DeleteFieldNetCdf** () override
- virtual void **brathl::CBratAlgorithmGeosVelGrid::DeleteProduct** () override
- virtual void **brathl::CBratAlgorithmGeosVelGrid::Dump** (std::ostream &fOut=std::cerr) override
- virtual void **brathl::CBratAlgorithmGeosVelGridU::Dump** (std::ostream &fOut=std::cerr) override
- virtual void **brathl::CBratAlgorithmGeosVelGridV::Dump** (std::ostream &fOut=std::cerr) override
- virtual std::string **brathl::CBratAlgorithmGeosVelGridU::GetDescription** () const override
- virtual std::string **brathl::CBratAlgorithmGeosVelGridV::GetDescription** () const override
- virtual std::string **brathl::CBratAlgorithmGeosVelGrid::GetInputParamDesc** (uint32\_t indexParam) const override
- virtual  
    CBratAlgorithmParam::bratAlgoParamTypeVal      **brathl::CBratAlgorithmGeosVelGrid::GetInputParam-  
    Format** (uint32\_t indexParam) const override
- virtual std::string **brathl::CBratAlgorithmGeosVelGrid::GetInputParamUnit** (uint32\_t indexParam) const override
- uint32\_t **brathl::CBratAlgorithmGeosVelGrid::GetLatDimRange** (CFieldNetCdf \*field)
- int32\_t **brathl::CBratAlgorithmGeosVelGrid::GetLatitudeIndex** (double value)
- void **brathl::CBratAlgorithmGeosVelGrid::GetLatitudes** ()
- uint32\_t **brathl::CBratAlgorithmGeosVelGrid::GetLonDimRange** (CFieldNetCdf \*field)
- int32\_t **brathl::CBratAlgorithmGeosVelGrid::GetLongitudeIndex** (double value)
- void **brathl::CBratAlgorithmGeosVelGrid::GetLongitudes** ()
- virtual std::string **brathl::CBratAlgorithmGeosVelGridU::GetName** () const override
- virtual std::string **brathl::CBratAlgorithmGeosVelGridV::GetName** () const override
- virtual uint32\_t **brathl::CBratAlgorithmGeosVelGrid::GetNumInputParam** () const override
- virtual std::string **brathl::CBratAlgorithmGeosVelGrid::GetOutputUnit** () const override

- virtual double **bratl::CBratAlgorithmGeosVelGrid::GetParamDefaultValue** (uint32\_t indexParam)
- virtual std::string **bratl::CBratAlgorithmGeosVelGrid::GetParamName** (uint32\_t indexParam) const override
- void **bratl::CBratAlgorithmGeosVelGrid::GetVarCacheExpressionValue** (int32\_t minIndexLat, int32\_t maxIndexLat, int32\_t minIndexLon, int32\_t maxIndexLon)
- double **bratl::CBratAlgorithmGeosVelGrid::GetVarExpressionValue** (int32\_t indexLat, int32\_t indexLon)
- double **bratl::CBratAlgorithmGeosVelGrid::GetVarExpressionValueCache** (int32\_t indexLat, int32\_t indexLon)
- void **bratl::CBratAlgorithmGeosVelGrid::Init** ()
- void **bratl::CBratAlgorithmGeosVelGridU::Init** ()
- void **bratl::CBratAlgorithmGeosVelGridV::Init** ()
- virtual void **bratl::CBratAlgorithmGeosVelGrid::OpenProductFile** () override
- **CBratAlgorithmGeosVelGrid & bratl::CBratAlgorithmGeosVelGrid::operator=** (const **CBratAlgorithmGeosVelGrid** &copy)
- bool **bratl::CBratAlgorithmGeosVelGrid::PrepareComputeVelocity** ()
- virtual void **bratl::CBratAlgorithmGeosVelGrid::PrepareDataReading2D** (int32\_t minIndexLat, int32\_t maxIndexLat, int32\_t minIndexLon, int32\_t maxIndexLon)
- virtual void **bratl::CBratAlgorithmGeosVelGrid::PrepareDataReading2D** (int32\_t indexLat, int32\_t indexLon)
- virtual void **bratl::CBratAlgorithmGeosVelGrid::PrepareDataValues2DComplexExpression** (**CExpressionValue** &exprValue)
- virtual void **bratl::CBratAlgorithmGeosVelGrid::PrepareDataValues2DComplexExpressionWithAlgo** (**CExpressionValue** &exprValue)
- virtual void **bratl::CBratAlgorithmGeosVelGrid::PrepareDataValues2DOneField** (**CExpressionValue** &exprValue)
- virtual double **bratl::CBratAlgorithmGeosVelGrid::Run** (CVectorBratAlgorithmParam &args) override
- void **bratl::CBratAlgorithmGeosVelGrid::Set** (const **CBratAlgorithmGeosVelGrid** &copy)
- virtual void **bratl::CBratAlgorithmGeosVelGrid::SetBeginOfFile** () override
- virtual void **bratl::CBratAlgorithmGeosVelGrid::SetEndOfFile** () override
- virtual void **bratl::CBratAlgorithmGeosVelGrid::SetParamValues** (CVectorBratAlgorithmParam &args)
- virtual **bratl::CBratAlgorithmGeosVelGrid::~CBratAlgorithmGeosVelGrid** ()
- virtual **bratl::CBratAlgorithmGeosVelGridU::~CBratAlgorithmGeosVelGridU** ()
- virtual **bratl::CBratAlgorithmGeosVelGridV::~CBratAlgorithmGeosVelGridV** ()

#### Variables

- bool **bratl::CBratAlgorithmGeosVelGrid::m\_allLongitudes**
- static const uint32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_EQUATOR\_LAT\_LIMIT\_INDEX** = 3
- double **bratl::CBratAlgorithmGeosVelGrid::m\_equatorLimit**
- **CFieldNetCdf \* bratl::CBratAlgorithmGeosVelGrid::m\_fieldLat**
- **CFieldNetCdf \* bratl::CBratAlgorithmGeosVelGrid::m\_fieldLon**
- int32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_indexLat**
- int32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_indexLon**
- static const uint32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_INPUT\_PARAMS** = 4
- static const uint32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_LAT\_PARAM\_INDEX** = 0
- CDoubleArray **bratl::CBratAlgorithmGeosVelGrid::m\_latitudes**
- static const uint32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_LON\_PARAM\_INDEX** = 1
- CDoubleArray **bratl::CBratAlgorithmGeosVelGrid::m\_longitudes**
- double **bratl::CBratAlgorithmGeosVelGrid::m\_lonMax**
- double **bratl::CBratAlgorithmGeosVelGrid::m\_lonMin**
- **CExpressionValue bratl::CBratAlgorithmGeosVelGrid::m\_rawDataCache**
- static const uint32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_VAR\_PARAM\_INDEX** = 2
- int32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_varDimLatIndex**
- int32\_t **bratl::CBratAlgorithmGeosVelGrid::m\_varDimLonIndex**
- double **bratl::CBratAlgorithmGeosVelGrid::m\_varValue**

- double **bratl::CBratAlgorithmGeosVelGrid::m\_varValueE**
- double **bratl::CBratAlgorithmGeosVelGrid::m\_varValueN**
- double **bratl::CBratAlgorithmGeosVelGrid::m\_varValueS**
- double **bratl::CBratAlgorithmGeosVelGrid::m\_varValueW**

### 6.1.1 Detailed Description

### 6.1.2 Function Documentation

#### 6.1.2.1 **bratl::CBratAlgorithmGeosVelGrid::CBratAlgorithmGeosVelGrid ( )**

Default constructor

#### 6.1.2.2 **bratl::CBratAlgorithmGeosVelGrid::CBratAlgorithmGeosVelGrid ( const CBratAlgorithmGeosVelGrid & copy )**

Copy constructor

#### 6.1.2.3 **bratl::CBratAlgorithmGeosVelGridU::CBratAlgorithmGeosVelGridU ( )**

Default constructor

#### 6.1.2.4 **bratl::CBratAlgorithmGeosVelGridU::CBratAlgorithmGeosVelGridU ( const CBratAlgorithmGeosVelGridU & copy )**

Copy constructor

#### 6.1.2.5 **bratl::CBratAlgorithmGeosVelGridV::CBratAlgorithmGeosVelGridV ( )**

Default constructor

#### 6.1.2.6 **bratl::CBratAlgorithmGeosVelGridV::CBratAlgorithmGeosVelGridV ( const CBratAlgorithmGeosVelGridV & copy )**

Copy constructor

#### 6.1.2.7 **void bratl::CBratAlgorithmGeosVelGrid::Dump ( std::ostream & fOut = std::cerr ) [override], [virtual]**

Dump function

Reimplemented from **bratl::CBratAlgorithmGeosVel** (p. 128).

Reimplemented in **bratl::CBratAlgorithmGeosVelGridV** (p. 14), and **bratl::CBratAlgorithmGeosVelGridU** (p. 14).

References **bratl::CBratAlgorithmGeosVel::Dump()**.

Referenced by **bratl::CBratAlgorithmGeosVelGridU::Dump()**, and **bratl::CBratAlgorithmGeosVelGridV::Dump()**.

#### 6.1.2.8 **void bratl::CBratAlgorithmGeosVelGridU::Dump ( std::ostream & fOut = std::cerr ) [override], [virtual]**

Dump function

Reimplemented from **bratl::CBratAlgorithmGeosVelGrid** (p. 14).

References **bratl::CBratAlgorithmGeosVelGrid::Dump()**.

#### 6.1.2.9 **void bratl::CBratAlgorithmGeosVelGridV::Dump ( std::ostream & fOut = std::cerr ) [override], [virtual]**

Dump function



Reimplemented from **brathl::CBratAlgorithmGeosVelGrid** (p. 14).

References **brathl::CBratAlgorithmGeosVelGrid::Dump()**.

**6.1.2.10** `virtual std::string brathl::CBratAlgorithmGeosVelGridU::GetDescription ( ) const [inline],[override], [virtual]`

Gets the description of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

**6.1.2.11** `virtual std::string brathl::CBratAlgorithmGeosVelGridV::GetDescription ( ) const [inline],[override], [virtual]`

Gets the description of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

**6.1.2.12** `virtual std::string brathl::CBratAlgorithmGeosVelGrid::GetInputParamDesc ( uint32_t indexParam ) const [inline],[override],[virtual]`

Gets the description of an input parameter.

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
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Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

**6.1.2.13** `virtual CBratAlgorithmParam::bratAlgoParamTypeVal brathl::CBratAlgorithmGeosVelGrid::GetInputParamFormat ( uint32_t indexParam ) const [inline],[override],[virtual]`

Gets the format of an input parameter : **CBratAlgorithmParam::T\_DOUBLE** for double **CBratAlgorithmParam::T\_FLOAT** for float **CBratAlgorithmParam::T\_INT** for integer **CBratAlgorithmParam::T\_LONG** for long integer **CBratAlgorithmParam::T\_STRING** for `std::string` **CBratAlgorithmParam::T\_CHAR** for a character

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
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Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

**6.1.2.14** `virtual std::string brathl::CBratAlgorithmGeosVelGrid::GetInputParamUnit ( uint32_t indexParam ) const [inline],[override],[virtual]`

Gets the unit of an input parameter :

#### Parameters

<i>indexParam</i>	[in] : parameter index.
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Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

**6.1.2.15** `virtual std::string brathl::CBratAlgorithmGeosVelGridU::GetName ( ) const [inline],[override], [virtual]`

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

**6.1.2.16** `virtual std::string bratl::CBratAlgorithmGeosVelGridV::GetName ( ) const [inline],[override], [virtual]`

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

**6.1.2.17** `virtual uint32_t bratl::CBratAlgorithmGeosVelGrid::GetNumInputParam ( ) const [inline],[override], [virtual]`

Gets the number of input parameters to pass to the 'Run' function

Implements **bratl::CBratAlgorithmBase** (p. 125).

**6.1.2.18** `virtual std::string bratl::CBratAlgorithmGeosVelGrid::GetOutputUnit ( ) const [inline],[override], [virtual]`

Gets the unit of an output value returned by the 'Run' function.

#### Parameters

<i>indexParam</i>	[in] : parameter index.
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Implements **bratl::CBratAlgorithmBase** (p. 125).

**6.1.2.19** `CBratAlgorithmGeosVelGrid & bratl::CBratAlgorithmGeosVelGrid::operator= ( const CBratAlgorithmGeosVelGrid & copy )`

Overloads operator '='

**6.1.2.20** `double bratl::CBratAlgorithmGeosVelGrid::Run ( CVectorBratAlgorithmParam & args ) [override], [virtual]`

Runs the algorithm

#### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

#### Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

**6.1.2.21** `bratl::CBratAlgorithmGeosVelGrid::~~CBratAlgorithmGeosVelGrid ( ) [virtual]`

Destructor

**6.1.2.22** `bratl::CBratAlgorithmGeosVelGridU::~~CBratAlgorithmGeosVelGridU ( ) [virtual]`

Destructor

**6.1.2.23** `bratl::CBratAlgorithmGeosVelGridV::~~CBratAlgorithmGeosVelGridV ( ) [virtual]`

Destructor

## 6.2 Tools

### Namespaces

- namespace **brathl**

### Classes

- class **brathl::CDoubleMap**
- class **brathl::CDoublePtrArray**
- class **brathl::CDoublePtrDoubleMap**
- class **brathl::CExpressionValue**
- class **brathl::CExternalFilesAvisoGrid**
- class **brathl::CExternalFilesJason2**
- class **brathl::CExternalFilesNetCDF**
- class **brathl::CInternalFiles**
- class **brathl::CInternalFilesYFX**
- class **brathl::CInternalFilesZFX**
- class **brathl::CIntList**
- class **brathl::CIntMap**
- class **brathl::CObArray**
- class **brathl::CObDoubleMap**
- class **brathl::CObIntMap**
- class **brathl::CObList**
- class **brathl::CObMap**
- class **brathl::CObStack**
- class **brathl::CPtrMap**
- class **brathl::CRegisteredPass**
- class **brathl::CStringList**
- class **brathl::CStringMap**
- class **brathl::CTools**
- class **brathl::CUIntMap**

### Macros

- **#define ADD\_OFFSET\_ATTR** "add\_offset"
- **#define AT\_BEGINNING** 0xFFFFFFFFUL
- **#define AXIS\_ATTR** "axis"
- **#define COMMENT\_ATTR** "comment"
- **#define CONVENTIONS\_ATTR** "Conventions"
- **#define DATA\_SET\_ATTR** "data\_set"
- **#define FILE\_TITLE\_ATTR** "title"
- **#define FILE\_TYPE\_ATTR** "FileType"
- **#define FILL\_VALUE\_ATTR** "\_FillValue"
- **#define LONG\_NAME\_ATTR** "long\_name"
- **#define MISSION\_NAME\_ATTR** "mission\_name"
- **#define PRODUCT\_TYPE\_ATTR** "product\_type"
- **#define SCALE\_FACTOR\_ATTR** "scale\_factor"
- **#define STANDARD\_NAME\_ATTR** "standard\_name"
- **#define TITLE\_ATTR** "title"
- **#define UNITS\_ATTR** "units"
- **#define VALID\_MAX\_ATTR** "valid\_max"
- **#define VALID\_MIN\_ATTR** "valid\_min"

## Typedefs

- typedef std::vector< doublearray > **bratl::arraydoublearray**
- typedef std::vector< doubleptrarray > **bratl::arraydoubleptrarray**
- typedef std::vector< double > **bratl::doublearray**
- typedef std::map< std::string, CStringArray > **bratl::maparraystring**
- typedef std::map< std::string, CObjectTreeNode \* > **bratl::mapTreeNode**

## Functions

- void **bratl::CArrayDoublePtrArray::AdjustValidMinMax** (double value)
- void **bratl::CArrayDoubleArray::AdjustValidMinMax** (double value)
- DoublePtr **bratl::CMatrix::At** (uint32\_t i, uint32\_t j)
- CExternalFiles \* **bratl::BuildExistingExternalFileKind** (const std::string &Name)
- CInternalFiles \* **bratl::BuildExistingInternalFileKind** (const std::string &name, const CStringArray \*fieldNames)
- **bratl::CArrayDoubleArray::CArrayDoubleArray** ()  
*Empty CDoubleArray ctor.*
- **bratl::CArrayDoubleArray::CArrayDoubleArray** (const CArrayDoubleArray &a)
- **bratl::CArrayDoublePtrArray::CArrayDoublePtrArray** (bool bDelete=true)  
*Empty CDoubleArray ctor.*
- **bratl::CArrayDoublePtrArray::CArrayDoublePtrArray** (const CArrayDoublePtrArray &a)
- **bratl::CArrayStringMap::CArrayStringMap** ()  
*CStringMap (p. 305) ctor.*
- **bratl::CArrayStringMap::CArrayStringMap** (const CArrayStringMap &a)
- **bratl::CDoubleArrayOb::CDoubleArrayOb** (const CDoubleArrayOb &vect)
- **bratl::CDoubleMap::CDoubleMap** ()  
*CDoubleMap (p. 197) ctor.*
- **bratl::CDoublePtrArray::CDoublePtrArray** (bool bDelete=true)  
*Empty CDoublePtrArray (p. 197) ctor.*
- **bratl::CDoublePtrDoubleMap::CDoublePtrDoubleMap** (bool bDelete=true)  
*CDoublePtrDoubleMap (p. 198) ctor.*
- **bratl::CDoublePtrDoubleMap::CDoublePtrDoubleMap** (const CUIntArray &matrixDims, bool bDelete=true)
- **bratl::CIntList::CIntList** ()  
*Empty CIntList (p. 250) ctor.*
- **bratl::CIntList::CIntList** (const CIntList &list)
- **bratl::CIntMap::CIntMap** ()  
*CIntMap (p. 250) ctor.*
- virtual CBratObject \* **bratl::CDoubleArrayOb::Clone** ()
- virtual CBratObject \* **bratl::CObArrayOb::Clone** ()
- **bratl::CMatrix::CMatrix** (const CMatrix &m)
- **bratl::CMatrixDouble::CMatrixDouble** (uint32\_t nrows, uint32\_t ncols)
- **bratl::CMatrixDouble::CMatrixDouble** (const CMatrixDouble &m)
- **bratl::CMatrixDoublePtr::CMatrixDoublePtr** (uint32\_t nrows, uint32\_t ncols)
- **bratl::CMatrixDoublePtr::CMatrixDoublePtr** (const CMatrixDoublePtr &m)
- **bratl::CObArray::CObArray** (bool bDelete=true)  
*Empty CObArray (p. 260) ctor.*
- **bratl::CObArray::CObArray** (const CObArray &vect)
- **bratl::CObArrayOb::CObArrayOb** (bool bDelete=true)

- **brathl::CObArrayOb::CObArrayOb** (const CObArrayOb &vect)
- **brathl::CObDoubleMap::CObDoubleMap** (bool bDelete=true)  
*CObMap* (p. 264) ctor.
- **brathl::CObIntMap::CObIntMap** (bool bDelete=true)  
*CObMap* (p. 264) ctor.
- **brathl::CObList::CObList** (bool bDelete=true)  
*Empty CObList* (p. 263) ctor.
- **brathl::CObList::CObList** (const CObList &lst)
- **brathl::CObMap::CObMap** (bool bDelete=true)  
*CObMap* (p. 264) ctor.
- **brathl::CObMap::CObMap** (const CObMap &obMap)
- **brathl::CObStack::CObStack** (bool bDelete=true)  
*Empty CObArray* (p. 260) ctor.
- virtual bool **brathl::CStringList::Complement** (const CStringList &array, CStringList &complement) const
  
- **brathl::CPtrMap::CPtrMap** (bool bDelete=true)  
*CPtrMap* (p. 299) ctor.
- **brathl::CStringList::CStringList** ()  
*Empty CStringList* (p. 304) ctor.
- **brathl::CStringList::CStringList** (const CStringList &list)
- **brathl::CStringList::CStringList** (const stringlist &list)
- **brathl::CStringList::CStringList** (const CStringArray &vect)
- **brathl::CStringList::CStringList** (const stringarray &vect)
- **brathl::CStringMap::CStringMap** ()  
*CStringMap* (p. 305) ctor.
- **brathl::CUIntMap::CUIntMap** ()  
*CUIntMap* (p. 331) ctor.
- void **brathl::CDoublePtrArray::Delete** (DoublePtr matrix)
- void **brathl::CArrayDoublePtrArray::Delete** (DoublePtr matrix)
- void **brathl::CDoublePtrDoubleMap::Delete** (DoublePtr \*matrix)
- virtual void **brathl::CStringList::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CIntList::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CObList::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CDoublePtrArray::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CArrayDoublePtrArray::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CArrayDoubleArray::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CArrayStringMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CDoubleArrayOb::Dump** (std::ostream &fOut=std::cerr) const
- virtual void **brathl::CObArray::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CObArrayOb::Dump** (std::ostream &fOut=std::cerr) const
- virtual void **brathl::CStringMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CIntMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*

- virtual void **brathl::CUIntMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CDoubleMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CObMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::COblntMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CObDoubleMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CDoublePtrDoubleMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CPtrMap::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CMatrix::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CMatrixDoublePtr::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CMatrixDouble::Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **brathl::CStringList::Erase** (const std::string &str)
- virtual void **brathl::CStringList::Erase** (CStringList::iterator it)
- bool **brathl::CObList::Erase** (CBratObject \*ob)
- virtual bool **brathl::CObList::Erase** (CObList::iterator it)
- virtual bool **brathl::CDoublePtrArray::Erase** (CDoublePtrArray::iterator it)
- virtual bool **brathl::CDoublePtrArray::Erase** (int32\_t index)
- virtual bool **brathl::CArrayStringMap::Erase** (CArrayStringMap::iterator it)
- virtual bool **brathl::CArrayStringMap::Erase** (const std::string &key)
- bool **brathl::CObArray::Erase** (CBratObject \*ob)
- virtual bool **brathl::CObArray::Erase** (CObArray::iterator it)
- virtual bool **brathl::CObArray::Erase** (int32\_t index)
- virtual bool **brathl::CStringMap::Erase** (CStringMap::iterator it)
- virtual bool **brathl::CStringMap::Erase** (const std::string &key)
- virtual bool **brathl::CIntMap::Erase** (CIntMap::iterator it)
- virtual bool **brathl::CIntMap::Erase** (const std::string &key)
- virtual bool **brathl::CUIntMap::Erase** (CUIntMap::iterator it)
- virtual bool **brathl::CUIntMap::Erase** (const std::string &key)
- virtual bool **brathl::CDoubleMap::Erase** (CDoubleMap::iterator it)
- virtual bool **brathl::CDoubleMap::Erase** (const std::string &key)
- virtual bool **brathl::CObMap::Erase** (CObMap::iterator it)
- virtual bool **brathl::CObMap::Erase** (const std::string &key)
- virtual bool **brathl::COblntMap::Erase** (COblntMap::iterator it)
- virtual bool **brathl::COblntMap::Erase** (int32\_t key)
- virtual bool **brathl::CObDoubleMap::Erase** (CObDoubleMap::iterator it)
- virtual bool **brathl::CObDoubleMap::Erase** (double key)
- virtual bool **brathl::CDoublePtrDoubleMap::Erase** (CDoublePtrDoubleMap::iterator it)
- virtual bool **brathl::CDoublePtrDoubleMap::Erase** (double key)
- virtual bool **brathl::CPtrMap::Erase** (CPtrMap::iterator it)
- virtual bool **brathl::CPtrMap::Erase** (const std::string &key)
- virtual bool **brathl::CStringList::Exists** (const std::string &str) const
- virtual const CStringArray \* **brathl::CArrayStringMap::Exists** (const std::string &key) const
- virtual std::string **brathl::CStringMap::Exists** (const std::string &key) const
- virtual int32\_t **brathl::CIntMap::Exists** (const std::string &key) const

- virtual uint32\_t **brathl::CUIntMap::Exists** (const std::string &key) const
- virtual double **brathl::CDoubleMap::Exists** (const std::string &key) const
- virtual CBratObject \* **brathl::CObMap::Exists** (const std::string &key) const
- virtual CBratObject \* **brathl::CObIntMap::Exists** (int32\_t key) const
- virtual CBratObject \* **brathl::CObDoubleMap::Exists** (double key) const
- virtual DoublePtr \* **brathl::CDoublePtrDoubleMap::Exists** (double key) const
- virtual void \* **brathl::CPtrMap::Exists** (const std::string &key) const
- virtual bool **brathl::CStringList::ExistsNoCase** (const std::string &str) const
- virtual void **brathl::CStringList::ExtractKeys** (const std::string &str, const std::string &delim, bool bRemoveAll=true)
- virtual void **brathl::CStringList::ExtractStrings** (const std::string &str, const char delim, bool bRemoveAll=true)
- virtual void **brathl::CStringList::ExtractStrings** (const std::string &str, const std::string &delim, bool bRemoveAll=true)
- virtual int32\_t **brathl::CStringList::FindIndex** (const std::string &str, bool compareNoCase=false) const
- const CArrayDoublePtrArray & **brathl::CMatrixDoublePtr::GetData** ()
- const CArrayDoubleArray & **brathl::CMatrixDouble::GetData** ()
- bool **brathl::CObList::GetDelete** ()
- bool **brathl::CDoublePtrArray::GetDelete** ()
- bool **brathl::CArrayDoublePtrArray::GetDelete** ()
- bool **brathl::CObStack::GetDelete** ()
- bool **brathl::CObArray::GetDelete** ()
- bool **brathl::CObMap::GetDelete** ()
- bool **brathl::CObIntMap::GetDelete** ()
- bool **brathl::CObDoubleMap::GetDelete** ()
- bool **brathl::CDoublePtrDoubleMap::GetDelete** ()
- virtual void **brathl::CStringMap::GetKeys** (CStringArray &keys, bool bRemoveAll=true) const
- virtual void **brathl::CUIntMap::GetKeys** (CStringArray &keys, bool bRemoveAll=true)
- virtual void **brathl::CObMap::GetKeys** (CStringArray &keys, bool bRemoveAll=true, bool bUnique=false)
- virtual void **brathl::CObMap::GetKeys** (CStringList &keys, bool bRemoveAll=true, bool bUnique=false)
- virtual void **brathl::CObIntMap::GetKeys** (CIntArray &keys, bool bRemoveAll=true)
- virtual void **brathl::CObDoubleMap::GetKeys** (CDoubleArray &keys, bool bRemoveAll=true)
- virtual void **brathl::CDoublePtrDoubleMap::GetKeys** (CDoubleArray &keys, bool bRemoveAll=true)
- uint32\_t **brathl::CDoublePtrDoubleMap::GetMatrixColDim** (uint32\_t row)
- CStringArray \* **brathl::CMatrixDoublePtr::GetMatrixDataDimIndexes** ()
- uint32\_t **brathl::CDoublePtrArray::GetMatrixDim** (uint32\_t row)
- uint32\_t **brathl::CArrayDoublePtrArray::GetMatrixDim** (uint32\_t row)
- uint32\_t **brathl::CMatrixDoublePtr::GetMatrixDimData** (uint32\_t row)
- CUIntArray \* **brathl::CDoublePtrArray::GetMatrixDims** ()
- CUIntArray \* **brathl::CArrayDoublePtrArray::GetMatrixDims** ()
- CUIntArray \* **brathl::CDoublePtrDoubleMap::GetMatrixDims** ()
- CUIntArray \* **brathl::CMatrixDoublePtr::GetMatrixDimsData** ()
- size\_t **brathl::CDoublePtrArray::GetMatrixNumberOfDims** ()
- size\_t **brathl::CArrayDoublePtrArray::GetMatrixNumberOfDims** ()
- size\_t **brathl::CMatrixDoublePtr::GetMatrixNumberOfDimsData** ()
- size\_t **brathl::CDoublePtrDoubleMap::GetMatrixNumberOfRows** () const
- virtual uint32\_t **brathl::CMatrix::GetMatrixNumberOfValuesData** ()
- uint32\_t **brathl::CMatrixDoublePtr::GetMatrixNumberOfValuesData** ()
- uint32\_t **brathl::CMatrixDouble::GetMatrixNumberOfValuesData** ()
- void **brathl::CArrayDoublePtrArray::GetMinMaxValues** (double &min, double &max, bool recalc=true)
- void **brathl::CArrayDoubleArray::GetMinMaxValues** (double &min, double &max, bool recalc=true)
- virtual void **brathl::CMatrix::GetMinMaxValues** (double &min, double &max)=0
- virtual void **brathl::CMatrixDoublePtr::GetMinMaxValues** (double &min, double &max)
- virtual void **brathl::CMatrixDouble::GetMinMaxValues** (double &min, double &max)
- std::string **brathl::CMatrix::GetName** ()

- virtual size\_t **brathl::CMatrix::GetNumberOfCols** () const =0
- virtual size\_t **brathl::CMatrixDoublePtr::GetNumberOfCols** () const
- virtual size\_t **brathl::CMatrixDouble::GetNumberOfCols** () const
- virtual size\_t **brathl::CMatrix::GetNumberOfRows** () const =0
- virtual size\_t **brathl::CMatrixDoublePtr::GetNumberOfRows** () const
- virtual size\_t **brathl::CMatrixDouble::GetNumberOfRows** () const
- virtual size\_t **brathl::CMatrix::GetNumberOfValues** ()=0
- virtual size\_t **brathl::CMatrixDoublePtr::GetNumberOfValues** ()
- virtual size\_t **brathl::CMatrixDouble::GetNumberOfValues** ()
- std::string **brathl::CMatrix::GetXName** ()
- std::string **brathl::CMatrix::GetYName** ()
- void **brathl::CArrayDoublePtrArray::Init** ()
- void **brathl::CArrayDoubleArray::Init** ()
- void **brathl::CArrayStringMap::Init** ()
- void **brathl::CArrayDoublePtrArray::InitMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)
- void **brathl::CArrayDoubleArray::InitMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)
- virtual void **brathl::CMatrix::InitMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)=0
- void **brathl::CMatrixDoublePtr::InitMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)
- void **brathl::CMatrixDouble::InitMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)
- void **brathl::CArrayDoublePtrArray::InitMatrixData** (double initialValue=CTools::m\_defaultValueDOUBLE)
- void **brathl::CMatrixDoublePtr::InitMatrixDimsData** (const CUIntArray &matrixDims, double initialValue=CTools::m\_defaultValueDOUBLE)
- virtual void **brathl::CStringList::Insert** (const CStringList &list, bool bEnd=true)
- virtual void **brathl::CStringList::Insert** (const std::string &str, bool bEnd=true)
- virtual void **brathl::CStringList::Insert** (const CStringArray &vect, bool bEnd=true)
- virtual void **brathl::CStringList::Insert** (const stringarray &vect, bool bEnd=true)
- virtual void **brathl::CStringList::Insert** (const stringlist &lst, bool bEnd=true)
- virtual void **brathl::CIntList::Insert** (const CIntList &list, bool bEnd=true)
- virtual void **brathl::CIntList::Insert** (const int value, bool bEnd=true)
- virtual void **brathl::CObList::Insert** (const CObList &list, bool bEnd=true)
- virtual void **brathl::CObList::Insert** (CBratObject \*ob, bool bEnd=true)
- virtual void **brathl::CDoublePtrArray::Insert** (DoublePtr ob)
- virtual CStringArray \* **brathl::CArrayStringMap::Insert** (const std::string &key, const CStringArray &str, bool withExcept=true)
- virtual void **brathl::CObArray::Insert** (const CObArray &vect)
- virtual void **brathl::CObArray::Insert** (CBratObject \*ob)
- virtual std::string **brathl::CStringMap::Insert** (const std::string &key, const std::string &str, bool withExcept=true)
- virtual void **brathl::CStringMap::Insert** (const CStringMap &strmap, bool withExcept=true)
- virtual int32\_t **brathl::CIntMap::Insert** (const std::string &key, int32\_t value, bool withExcept=true)
- virtual void **brathl::CIntMap::Insert** (const CIntMap &m, bool bRemoveAll=true, bool withExcept=true)
- virtual void **brathl::CIntMap::Insert** (const CStringArray &keys, const CIntArray &values, bool bRemoveAll=true, bool withExcept=true)
- virtual uint32\_t **brathl::CUIntMap::Insert** (const std::string &key, uint32\_t value, bool withExcept=true)
- virtual void **brathl::CUIntMap::Insert** (const CUIntMap &m, bool bRemoveAll=true, bool withExcept=true)
- virtual void **brathl::CUIntMap::Insert** (const CStringArray &keys, uint32\_t initValue, bool bRemoveAll=true, bool withExcept=true)
- virtual void **brathl::CUIntMap::Insert** (const CStringArray &keys, const CUIntArray &values, bool bRemoveAll=true, bool withExcept=true)
- virtual void **brathl::CUIntMap::Insert** (const CStringArray &keys, bool bRemoveAll=true, bool withExcept=true)
- virtual double **brathl::CDoubleMap::Insert** (const std::string &key, double value, bool withExcept=true)
- virtual CBratObject \* **brathl::CObMap::Insert** (const std::string &key, CBratObject \*ob, bool withExcept=true)
- virtual void **brathl::CObMap::Insert** (const CObMap &obMap, bool withExcept=true)



- virtual CBratObject \* **brathl::COblntMap::Insert** (int32\_t key, CBratObject \*ob, bool withExcept=true)
- virtual void **brathl::COblntMap::Insert** (const **COblntMap** &obMap, bool withExcept=true)
- virtual CBratObject \* **brathl::CObDoubleMap::Insert** (double key, CBratObject \*ob, bool withExcept=true)
- virtual void **brathl::CObDoubleMap::Insert** (const **CObDoubleMap** &obMap, bool withExcept=true)
- virtual DoublePtr \* **brathl::CDoublePtrDoubleMap::Insert** (double key, DoublePtr \*ob, bool withExcept=true)
- virtual DoublePtr \* **brathl::CDoublePtrDoubleMap::Insert** (double key, double initialValue=CTools::m\_defaultValueDOUBLE)
- virtual void \* **brathl::CPtrMap::Insert** (const std::string &key, void \*ptr, bool withExcept=true)
- virtual void **brathl::CPtrMap::Insert** (const **CPtrMap** &ptrMap, bool withExcept=true)
- virtual CDoublePtrArray::iterator **brathl::CDoublePtrArray::InsertAt** (CDoublePtrArray::iterator where, DoublePtr ob)
- virtual CObArray::iterator **brathl::CObArray::InsertAt** (CObArray::iterator where, CBratObject \*ob)
- virtual void **brathl::CStringList::InsertUnique** (const std::string &str, bool bEnd=true)
- virtual void **brathl::CStringList::InsertUnique** (const **CStringList** &lst, bool bEnd=true)
- virtual void **brathl::CStringList::InsertUnique** (const CStringArray \*vect, bool bEnd=true)
- virtual void **brathl::CStringList::InsertUnique** (const CStringArray &vect, bool bEnd=true)
- virtual void **brathl::CStringList::InsertUnique** (const **stringarray** &vect, bool bEnd=true)
- virtual void **brathl::CStringList::InsertUnique** (const **stringlist** &lst, bool bEnd=true)
- virtual bool **brathl::CStringList::Intersect** (const **CStringList** &array, **CStringList** &intersect) const
- virtual bool **brathl::CMatrix::IsMatrixDataSet** ()
- bool **brathl::CMatrixDoublePtr::IsMatrixDataSet** ()
- virtual std::string **brathl::CStringMap::IsValue** (const std::string &value)
- DoublePtr **brathl::CDoublePtrArray::NewMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)
- DoublePtr **brathl::CArrayDoublePtrArray::NewMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)
- DoublePtr \* **brathl::CDoublePtrDoubleMap::NewMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)
- DoublePtr **brathl::CMatrixDoublePtr::NewMatrixData** (double initialValue=CTools::m\_defaultValueDOUBLE)
- virtual DoublePtr **brathl::CMatrix::operator()** (uint32\_t i, uint32\_t j)=0
- virtual DoublePtr **brathl::CMatrix::operator()** (uint32\_t i, uint32\_t j) const =0
- virtual DoublePtr **brathl::CMatrixDoublePtr::operator()** (uint32\_t i, uint32\_t j)
- virtual DoublePtr **brathl::CMatrixDoublePtr::operator()** (uint32\_t i, uint32\_t j) const
- virtual DoublePtr **brathl::CMatrixDouble::operator()** (uint32\_t i, uint32\_t j)
- virtual DoublePtr **brathl::CMatrixDouble::operator()** (uint32\_t i, uint32\_t j) const
- virtual const **CStringList** & **brathl::CStringList::operator=** (const **CStringList** &lst)
- virtual const **CStringList** & **brathl::CStringList::operator=** (const CStringArray &vect)
- virtual const **CStringList** & **brathl::CStringList::operator=** (const **stringarray** &vect)
- virtual const **CStringList** & **brathl::CStringList::operator=** (const **stringlist** &lst)
- const **CIntList** & **brathl::CIntList::operator=** (const **CIntList** &lst)
- virtual const **CObList** & **brathl::CObList::operator=** (const **CObList** &lst)
- virtual const  
CArrayDoublePtrArray & **brathl::CArrayDoublePtrArray::operator=** (const CArrayDoublePtrArray &m)
- virtual const CArrayDoubleArray & **brathl::CArrayDoubleArray::operator=** (const CArrayDoubleArray &m)
- virtual const CArrayStringMap & **brathl::CArrayStringMap::operator=** (const CArrayStringMap &a)
- virtual const CDoubleArrayOb & **brathl::CDoubleArrayOb::operator=** (const CDoubleArrayOb &vect)
- virtual const **CObArray** & **brathl::CObArray::operator=** (const **CObArray** &lst)
- virtual const CObArrayOb & **brathl::CObArrayOb::operator=** (const CObArrayOb &vect)
- virtual const **CObMap** & **brathl::CObMap::operator=** (const **CObMap** &obMap)
- virtual const **COblntMap** & **brathl::COblntMap::operator=** (const **COblntMap** &obMap)
- virtual const **CObDoubleMap** & **brathl::CObDoubleMap::operator=** (const **CObDoubleMap** &obMap)
- const CMatrix & **brathl::CMatrix::operator=** (const CMatrix &m)
- const CMatrixDoublePtr & **brathl::CMatrixDoublePtr::operator=** (const CMatrixDoublePtr &m)
- const CMatrixDouble & **brathl::CMatrixDouble::operator=** (const CMatrixDouble &m)

- virtual int32\_t **brathl::CIntMap::operator[]** (const std::string &key)
- virtual uint32\_t **brathl::CUIntMap::operator[]** (const std::string &key)
- virtual double **brathl::CDoubleMap::operator[]** (const std::string &key)
- virtual CBratObject \* **brathl::CObMap::operator[]** (const std::string &key)
- virtual CBratObject \* **brathl::CObIntMap::operator[]** (int32\_t key)
- virtual CBratObject \* **brathl::CObDoubleMap::operator[]** (double key)
- virtual DoublePtr \* **brathl::CDoublePtrDoubleMap::operator[]** (double key)
- virtual void \* **brathl::CPtrMap::operator[]** (const std::string &key)
- virtual doubleptrarray & **brathl::CMatrixDoublePtr::operator[]** (const uint32\_t &i)
- virtual const doubleptrarray & **brathl::CMatrixDoublePtr::operator[]** (const uint32\_t &i) const
- virtual doublearray & **brathl::CMatrixDouble::operator[]** (const uint32\_t &i)
- virtual const doublearray & **brathl::CMatrixDouble::operator[]** (const uint32\_t &i) const
- virtual void **brathl::CObStack::Pop** ()
- virtual bool **brathl::CObList::PopBack** ()
- virtual bool **brathl::CDoublePtrArray::PopBack** ()
- virtual bool **brathl::CObArray::PopBack** ()
- virtual void **brathl::CObStack::Push** (CBratObject \*ob)
- virtual void **brathl::CArrayDoublePtrArray::Remove** (doubleptrarray &vect)
- virtual void **brathl::CStringList::RemoveAll** ()
- virtual void **brathl::CIntList::RemoveAll** ()
- virtual void **brathl::CObList::RemoveAll** ()
- virtual void **brathl::CDoublePtrArray::RemoveAll** ()
- virtual void **brathl::CArrayDoublePtrArray::RemoveAll** ()
- virtual void **brathl::CArrayDoubleArray::RemoveAll** ()
- virtual void **brathl::CArrayStringMap::RemoveAll** ()
- virtual void **brathl::CObStack::RemoveAll** ()
- virtual void **brathl::CObArray::RemoveAll** ()
- virtual void **brathl::CStringMap::RemoveAll** ()
- virtual void **brathl::CIntMap::RemoveAll** ()
- virtual void **brathl::CUIntMap::RemoveAll** ()
- virtual void **brathl::CDoubleMap::RemoveAll** ()
- virtual void **brathl::CObMap::RemoveAll** ()
- virtual void **brathl::CObIntMap::RemoveAll** ()
- virtual void **brathl::CObDoubleMap::RemoveAll** ()
- virtual void **brathl::CDoublePtrDoubleMap::RemoveAll** ()
- virtual void **brathl::CPtrMap::RemoveAll** ()
- bool **brathl::CObMap::RenameKey** (const std::string &oldKey, const std::string &newKey)
- bool **brathl::CObIntMap::RenameKey** (int32\_t oldKey, int32\_t newKey)
- bool **brathl::CObDoubleMap::RenameKey** (double oldKey, double newKey)
- bool **brathl::CDoublePtrDoubleMap::RenameKey** (double oldKey, double newKey)
- virtual CDoublePtrArray::iterator **brathl::CDoublePtrArray::ReplaceAt** (CDoublePtrArray::iterator where, DoublePtr ob)
- virtual CObArray::iterator **brathl::CObArray::ReplaceAt** (CObArray::iterator where, CBratObject \*ob)
- void **brathl::CArrayDoublePtrArray::ResizeRC** (uint32\_t nrows, uint32\_t ncols)
- void **brathl::CArrayDoubleArray::ResizeRC** (uint32\_t nrows, uint32\_t ncols)
- virtual void **brathl::CMatrix::ScaleDownData** (double scaleFactor, double addOffset, double defaultValue=CTools::m\_defaultValueDOUBLE)=0
- virtual void **brathl::CMatrixDoublePtr::ScaleDownData** (double scaleFactor, double addOffset, double defaultValue=CTools::m\_defaultValueDOUBLE)
- virtual void **brathl::CMatrixDouble::ScaleDownData** (double scaleFactor, double addOffset, double defaultValue=CTools::m\_defaultValueDOUBLE)
- virtual void **brathl::CMatrix::ScaleUpData** (double scaleFactor, double addOffset, double defaultValue=CTools::m\_defaultValueDOUBLE)=0
- virtual void **brathl::CMatrixDoublePtr::ScaleUpData** (double scaleFactor, double addOffset, double defaultValue=CTools::m\_defaultValueDOUBLE)

- virtual void **brathl::CMatrixDouble::ScaleUpData** (double scaleFactor, double addOffset, double default-Value=CTools::m\_defaultValueDOUBLE)
  - void **brathl::CArrayDoublePtrArray::Set** (const CArrayDoublePtrArray &m)
  - void **brathl::CArrayDoubleArray::Set** (const CArrayDoubleArray &m)
  - virtual void **brathl::CArrayStringMap::Set** (const CArrayStringMap &a)
  - virtual void **brathl::CMatrix::Set** (const CMatrix &m)
  - virtual void **brathl::CMatrix::Set** (uint32\_t &row, uint32\_t &col, DoublePtr x)=0
  - void **brathl::CMatrixDoublePtr::Set** (uint32\_t &row, uint32\_t &col, DoublePtr x)
  - void **brathl::CMatrixDoublePtr::Set** (const CMatrixDoublePtr &m)
  - void **brathl::CMatrixDouble::Set** (uint32\_t &row, uint32\_t &col, DoublePtr x)
  - void **brathl::CMatrixDouble::Set** (const CMatrixDouble &m)
  - void **brathl::CObList::SetDelete** (bool value)
  - void **brathl::CDoublePtrArray::SetDelete** (bool value)
  - void **brathl::CArrayDoublePtrArray::SetDelete** (bool value)
  - void **brathl::CObStack::SetDelete** (bool value)
  - void **brathl::CObArray::SetDelete** (bool value)
  - void **brathl::CObMap::SetDelete** (bool value)
  - void **brathl::CObIntMap::SetDelete** (bool value)
  - void **brathl::CObDoubleMap::SetDelete** (bool value)
  - void **brathl::CDoublePtrDoubleMap::SetDelete** (bool value)
  - void **brathl::CMatrixDoublePtr::SetMatrixDataDimIndexes** (const CStringArray &m)
  - void **brathl::CDoublePtrArray::SetMatrixDims** (const CUIntArray &matrixDims)
  - void **brathl::CArrayDoublePtrArray::SetMatrixDims** (const CUIntArray &matrixDims)
  - void **brathl::CDoublePtrDoubleMap::SetMatrixDims** (const CUIntArray &matrixDims)
  - void **brathl::CMatrixDoublePtr::SetMatrixDimsData** (const CUIntArray &matrixDims)
  - void **brathl::CMatrixDoublePtr::SetMatrixDimsData** (uint32\_t nbValues)
  - void **brathl::CMatrix::SetName** (const std::string &value)
  - void **brathl::CMatrix::SetXName** (const std::string &value)
  - void **brathl::CMatrix::SetYName** (const std::string &value)
  - virtual void **brathl::CObMap::ToArray** (CObArray &obArray)
  - virtual CBratObject \* **brathl::CObStack::Top** ()
  - virtual std::string **brathl::CStringList::ToString** (const std::string &delim="," , bool useBracket=true) const
  - virtual **brathl::CArrayDoubleArray::~CArrayDoubleArray** ()
- Destructor.*
- virtual **brathl::CArrayDoublePtrArray::~CArrayDoublePtrArray** ()
- Destructor.*
- virtual **brathl::CArrayStringMap::~CArrayStringMap** ()
- CStringMap* (p. 305) *dtor.*
- virtual **brathl::CDoubleMap::~CDoubleMap** ()
- CDoubleMap* (p. 197) *dtor.*
- virtual **brathl::CDoublePtrArray::~CDoublePtrArray** ()
- Destructor.*
- virtual **brathl::CDoublePtrDoubleMap::~CDoublePtrDoubleMap** ()
- CDoublePtrDoubleMap* (p. 198) *dtor.*
- virtual **brathl::CIntList::~CIntList** ()
- Destructor.*
- virtual **brathl::CIntMap::~CIntMap** ()
- CIntMap* (p. 250) *dtor.*
- virtual **brathl::CObArray::~CObArray** ()
- Destructor.*
- virtual **brathl::CObDoubleMap::~CObDoubleMap** ()
- CObMap* (p. 264) *dtor.*
- virtual **brathl::CObIntMap::~CObIntMap** ()

- *CObMap* (p. 264) *dtor.*
- virtual **brathl::CObList::~~CObList** ()  
*Destructor.*
- virtual **brathl::CObMap::~~CObMap** ()  
*CObMap* (p. 264) *dtor.*
- virtual **brathl::CObStack::~~CObStack** ()  
*Destructor.*
- virtual **brathl::CPtrMap::~~CPtrMap** ()  
*CPtrMap* (p. 299) *dtor.*
- virtual **brathl::CStringList::~~CStringList** ()  
*Destructor.*
- virtual **brathl::CStringMap::~~CStringMap** ()  
*CStringMap* (p. 305) *dtor.*
- virtual **brathl::CUIntMap::~~CUIntMap** ()  
*CUIntMap* (p. 331) *dtor.*

## Variables

- const std::string **brathl::GENERIC\_NETCDF\_TYPE** = "Generic NetCdf"
- bool **brathl::CObList::m\_bDelete**
- bool **brathl::CDoublePtrArray::m\_bDelete**
- bool **brathl::CArrayDoublePtrArray::m\_bDelete**
- bool **brathl::CObStack::m\_bDelete**  
*Dump fonction.*
- bool **brathl::CObArray::m\_bDelete**
- bool **brathl::CObMap::m\_bDelete**
- bool **brathl::CObIntMap::m\_bDelete**
- bool **brathl::CObDoubleMap::m\_bDelete**
- bool **brathl::CDoublePtrDoubleMap::m\_bDelete**
- bool **brathl::CPtrMap::m\_bDelete**
- CArrayDoublePtrArray **brathl::CMatrixDoublePtr::m\_data**
- CStringArray **brathl::CMatrixDoublePtr::m\_matrixDataDimIndexes**
- CUIntArray **brathl::CDoublePtrArray::m\_matrixDims**
- CUIntArray **brathl::CArrayDoublePtrArray::m\_matrixDims**
- CUIntArray **brathl::CDoublePtrDoubleMap::m\_matrixDims**
- double **brathl::CArrayDoublePtrArray::m\_maxValue**
- double **brathl::CArrayDoubleArray::m\_maxValue**
- double **brathl::CArrayDoublePtrArray::m\_minValue**
- double **brathl::CArrayDoubleArray::m\_minValue**
- const std::string **brathl::NETCDF\_CF\_PRODUCT\_CLASS** = "NETCDF\_CF"
- const std::string **brathl::NETCDF\_PRODUCT\_CLASS** = "NETCDF"
- const std::string **brathl::UNKNOWN\_PRODUCT\_CLASS** = "UNKNOWN"
- const std::string **brathl::YFX\_NETCDF\_TYPE** = "Y=F(X)"
- const std::string **brathl::ZFGY\_NETCDF\_TYPE** = "Z=F(X,Y)"

### 6.2.1 Detailed Description

### 6.2.2 Macro Definition Documentation

#### 6.2.2.1 #define FILL\_VALUE\_ATTR "\_FillValue"

NetCDF files access.

## Version

1.0

### 6.2.3 Typedef Documentation

#### 6.2.3.1 `typedef std::vector<doubleptrarray> brathl::arraydoubleptrarray`

An array (std::vector) of std::vector of double pointer

Version

1.0

Creates a type name for array of DoublePtr array

#### 6.2.3.2 `typedef std::vector<double> brathl::doublearray`

An array (std::vector) of std::vector of double

Version

1.0

Creates a type name for array of double array

#### 6.2.3.3 `typedef std::map<std::string, CStringArray> brathl::maparraystring`

a set of array std::string value management classes.

Version

1.0

Creates a type name for std::map of std::string array

### 6.2.4 Function Documentation

#### 6.2.4.1 `CExternalFiles * brathl::BuildExistingExternalFileKind ( const std::string & Name )`

External files access.

Version

1.0

#### 6.2.4.2 `CInternalFiles * brathl::BuildExistingInternalFileKind ( const std::string & name, const CStringArray * fieldNames = NULL )`

Internal files access.

Version

1.0

References brathl::CTools::Format().

#### 6.2.4.3 `brathl::CIntList::CIntList ( const CIntList & list )`

Creates new **CIntList** (p. 250) object from another **CStringList** (p. 304)

Parameters

<i>std::list</i>	[in] : std::list to be copied
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#### 6.2.4.4 bratl::CObArray::CObArray ( const CObArray & vect )

Creates new **CObArray** (p. 260) object from another **CObArray** (p. 260)

##### Parameters

<i>vect</i>	[in] : std::list to be copied
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#### 6.2.4.5 bratl::CObList::CObList ( const CObList & lst )

Creates new **CObList** (p. 263) object from another **CStringList** (p. 304)

##### Parameters

<i>lst</i>	[in] : std::list to be copied
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#### 6.2.4.6 bratl::CStringList::CStringList ( const CStringList & list )

Creates new **CStringList** (p. 304) object from another **CStringList** (p. 304)

##### Parameters

<i>std::list</i>	[in] : std::list to be copied
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#### 6.2.4.7 bool bratl::CObList::Erase ( CBratObject \* ob )

Delete an element referenced by ob

##### Returns

true if no error, otherwise false

#### 6.2.4.8 bool bratl::CObList::Erase ( CObList::iterator it ) [virtual]

Delete an element referenced by it

##### Returns

true if no error, otherwise false

#### 6.2.4.9 bool bratl::CDoublePtrArray::Erase ( CDoublePtrArray::iterator it ) [virtual]

Delete an element referenced by it

##### Returns

true if no error, otherwise false

Referenced by bratl::CDoublePtrArray::Erase().

#### 6.2.4.10 bool bratl::CDoublePtrArray::Erase ( int32\_t index ) [virtual]

Delete an element referenced by index

##### Returns

true if no error, otherwise false

References bratl::CDoublePtrArray::Erase().

**6.2.4.11** `bool brathl::CStringMap::Erase ( CStringMap::iterator it )` [virtual]

Delete an element referenced by it

Returns

true if no error, otherwise false

**6.2.4.12** `bool brathl::CStringMap::Erase ( const std::string & key )` [virtual]

Delete an element by its key

Returns

true if no error, otherwise false

**6.2.4.13** `bool brathl::CObArray::Erase ( CBratObject * ob )`

Delete an element referenced by ob

Returns

true if no error, otherwise false

Referenced by brathl::CObArray::Erase().

**6.2.4.14** `bool brathl::CObArray::Erase ( CObArray::iterator it )` [virtual]

Delete an element referenced by it

Returns

true if no error, otherwise false

**6.2.4.15** `bool brathl::CObArray::Erase ( int32_t index )` [virtual]

Delete an element referenced by index

Returns

true if no error, otherwise false

References brathl::CObArray::Erase().

**6.2.4.16** `bool brathl::CStringMap::Erase ( CStringMap::iterator it )` [virtual]

Delete an element referenced by it

Returns

true if no error, otherwise false

Referenced by brathl::CStringMap::Erase().

**6.2.4.17** `bool brathl::CStringMap::Erase ( const std::string & key )` [virtual]

Delete an element by its key

Returns

true if no error, otherwise false

References brathl::CStringMap::Erase().

**6.2.4.18** `bool brathl::CIntMap::Erase ( CIntMap::iterator it )` [virtual]

Delete an element referenced by it

**Returns**

true if no error, otherwise false

Referenced by `brathl::CIntMap::Erase()`.

**6.2.4.19** `bool brathl::CIntMap::Erase ( const std::string & key )` [virtual]

Delete an element by its key

**Returns**

true if no error, otherwise false

References `brathl::CIntMap::Erase()`.

**6.2.4.20** `bool brathl::CUIntMap::Erase ( CUIntMap::iterator it )` [virtual]

Delete an element referenced by it

**Returns**

true if no error, otherwise false

Referenced by `brathl::CUIntMap::Erase()`.

**6.2.4.21** `bool brathl::CUIntMap::Erase ( const std::string & key )` [virtual]

Delete an element by its key

**Returns**

true if no error, otherwise false

References `brathl::CUIntMap::Erase()`.

**6.2.4.22** `bool brathl::CDoubleMap::Erase ( CDoubleMap::iterator it )` [virtual]

Delete an element referenced by it

**Returns**

true if no error, otherwise false

Referenced by `brathl::CDoubleMap::Erase()`.

**6.2.4.23** `bool brathl::CDoubleMap::Erase ( const std::string & key )` [virtual]

Delete an element by its key

**Returns**

true if no error, otherwise false

References `brathl::CDoubleMap::Erase()`.



**6.2.4.24** `bool brathl::CObMap::Erase ( CObMap::iterator it ) [virtual]`

Delete an element referenced by it

**Returns**

true if no error, otherwise false

Referenced by `brathl::CObMap::Erase()`, and `brathl::CDataSet::EraseFieldSet()`.

**6.2.4.25** `bool brathl::CObMap::Erase ( const std::string & key ) [virtual]`

Delete an element by its key

**Returns**

true if no error, otherwise false

References `brathl::CObMap::Erase()`.

**6.2.4.26** `bool brathl::CObIntMap::Erase ( CObIntMap::iterator it ) [virtual]`

Delete an element referenced by it

**Returns**

true if no error, otherwise false

Referenced by `brathl::CObIntMap::Erase()`.

**6.2.4.27** `bool brathl::CObIntMap::Erase ( int32_t key ) [virtual]`

Delete an element by its key

**Returns**

true if no error, otherwise false

References `brathl::CObIntMap::Erase()`.

**6.2.4.28** `bool brathl::CObDoubleMap::Erase ( CObDoubleMap::iterator it ) [virtual]`

Delete an element referenced by it

**Returns**

true if no error, otherwise false

Referenced by `brathl::CObDoubleMap::Erase()`.

**6.2.4.29** `bool brathl::CObDoubleMap::Erase ( double key ) [virtual]`

Delete an element by its key

**Returns**

true if no error, otherwise false

References `brathl::CObDoubleMap::Erase()`.

**6.2.4.30** `bool brathl::CDoublePtrDoubleMap::Erase ( CDoublePtrDoubleMap::iterator it ) [virtual]`

Delete an element referenced by it

#### Returns

true if no error, otherwise false

Referenced by `brathl::CDoublePtrDoubleMap::Erase()`.

**6.2.4.31** `bool brathl::CDoublePtrDoubleMap::Erase ( double key ) [virtual]`

Delete an element by its key

#### Returns

true if no error, otherwise false

References `brathl::CDoublePtrDoubleMap::Erase()`.

**6.2.4.32** `bool brathl::CPtrMap::Erase ( CPtrMap::iterator it ) [virtual]`

Delete an element referenced by it

#### Returns

true if no error, otherwise false

Referenced by `brathl::CPtrMap::Erase()`.

**6.2.4.33** `bool brathl::CPtrMap::Erase ( const std::string & key ) [virtual]`

Delete an element by its key

#### Returns

true if no error, otherwise false

References `brathl::CPtrMap::Erase()`.

**6.2.4.34** `const CStringArray * brathl::CArrayStringMap::Exists ( const std::string & key ) const [virtual]`

Tests if an element identify by 'key' already exists

#### Returns

a `std::string` array value corresponding to the key; if exists, otherwise empty `std::string`

**6.2.4.35** `std::string brathl::CStringMap::Exists ( const std::string & key ) const [virtual]`

Tests if an element identify by 'key' already exists

#### Returns

a `std::string` value corresponding to the key; if exists, otherwise empty `std::string`

**6.2.4.36** `int32_t brathl::CIntMap::Exists ( const std::string & key ) const [virtual]`

Tests if an element identify by 'key' already exists

**Returns**

a integer value corresponding to the key; if exists, otherwise default value **CTools::m\_defaultValueINT32** (p. 309)

References bratl::CTools::m\_defaultValueINT32.

Referenced by bratl::CIntMap::operator[]().

**6.2.4.37** `uint32_t bratl::CUIntMap::Exists ( const std::string & key ) const` [virtual]

Tests if an element identify by 'key' already exists

**Returns**

a integer value corresponding to the key; if exists, otherwise default value **CTools::m\_defaultValueUINT32** (p. 309)

References bratl::CTools::m\_defaultValueUINT32.

Referenced by bratl::CUIntMap::operator[]().

**6.2.4.38** `double bratl::CDoubleMap::Exists ( const std::string & key ) const` [virtual]

Tests if an element identify by 'key' already exists

**Returns**

a double value corresponding to the key; if exists, otherwise default value **CTools::m\_defaultValueDOUBLE** (p. 309)

References bratl::CTools::m\_defaultValueDOUBLE.

Referenced by bratl::CDoubleMap::operator[]().

**6.2.4.39** `CBratObject * bratl::COBMap::Exists ( const std::string & key ) const` [virtual]

Tests if an element identify by 'key' already exists

**Returns**

a CBratObject pointer if exists, otherwise NULL

**6.2.4.40** `CBratObject * bratl::COBIntMap::Exists ( int32_t key ) const` [virtual]

Tests if an element identify by 'key' already exists

**Returns**

a CBratObject pointer if exists, otherwise NULL

**6.2.4.41** `CBratObject * bratl::COBDoubleMap::Exists ( double key ) const` [virtual]

Tests if an element identify by 'key' already exists

**Returns**

a CBratObject pointer if exists, otherwise NULL

**6.2.4.42** `DoublePtr * bratl::CDoublePtrDoubleMap::Exists ( double key ) const` [virtual]

Tests if an element identify by 'key' already exists

Returns

a CBratObject pointer if exists, otherwise NULL

**6.2.4.43** `void * bratl::CPtrMap::Exists ( const std::string & key ) const` [virtual]

Tests if an element identify by 'key' already exists

Returns

a pointer if exists, otherwise NULL

**6.2.4.44** `void bratl::CStringMap::GetKeys ( CStringArray & keys, bool bRemoveAll=true ) const` [virtual]

Gets keys of the std::map

Parameters

<i>keys</i>	[out] : the keys of the std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

**6.2.4.45** `void bratl::CUIntMap::GetKeys ( CStringArray & keys, bool bRemoveAll=true )` [virtual]

Gets keys of the std::map

Parameters

<i>keys</i>	[out] : the keys of the std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

**6.2.4.46** `void bratl::CObMap::GetKeys ( CStringArray & keys, bool bRemoveAll=true, bool bUnique=false )`  
[virtual]

Gets keys of the std::map

Parameters

<i>keys</i>	[out] : the keys of the std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

**6.2.4.47** `void bratl::CObMap::GetKeys ( CStringList & keys, bool bRemoveAll=true, bool bUnique=false )`  
[virtual]

Gets keys of the std::map

Parameters

<i>keys</i>	[out] : the keys of the std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

**6.2.4.48** `void bratl::COblntMap::GetKeys ( CIntArray & keys, bool bRemoveAll=true )` [virtual]

Gets keys of the std::map

## Parameters

<i>keys</i>	[out] : the keys of the std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

6.2.4.49 `void brathl::CObDoubleMap::GetKeys ( CDoubleArray & keys, bool bRemoveAll = true ) [virtual]`

Gets keys of the std::map

## Parameters

<i>keys</i>	[out] : the keys of the std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

6.2.4.50 `void brathl::CDoublePtrDoubleMap::GetKeys ( CDoubleArray & keys, bool bRemoveAll = true ) [virtual]`

Gets keys of the std::map

## Parameters

<i>keys</i>	[out] : the keys of the std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

6.2.4.51 `CStringArray * brathl::CArrayStringMap::Insert ( const std::string & key, const CStringArray & str, bool withExcept = true ) [virtual]`

Inserts a std::string

## Parameters

<i>key</i>	: std::map key
<i>str</i>	: std::string value

## Returns

the inserted std::string value or existing std::string value if key exists

6.2.4.52 `std::string brathl::CStringMap::Insert ( const std::string & key, const std::string & str, bool withExcept = true ) [virtual]`

Inserts a std::string

## Parameters

<i>key</i>	: std::map key
<i>str</i>	: std::string value

## Returns

the inserted std::string value or existing std::string value if key exists

Referenced by `brathl::CStringMap::Insert()`.

6.2.4.53 `void brathl::CStringMap::Insert ( const CStringMap & strmap, bool withExcept = true ) [virtual]`

Inserts a std::string std::map

## Parameters

<i>strmap</i>	: std::map to insert
<i>withExcept</i>	: true for exception handling, flse otherwise

## Returns

the inserted std::string value or existing std::string value if key exists

References brathl::CStringMap::Insert().

6.2.4.54 `int32_t brathl::CIntMap::Insert ( const std::string & key, int32_t value, bool withExcept = true ) [virtual]`

Inserts an integer

## Parameters

<i>key</i>	: std::map key
<i>value</i>	: int value

## Returns

the inserted integer value or existing integer value if key exists

Referenced by brathl::CIntMap::Insert().

6.2.4.55 `void brathl::CIntMap::Insert ( const CIntMap & m, bool bRemoveAll = true, bool withExcept = true ) [virtual]`

Inserts a **CIntMap** (p. 250)

## Parameters

<i>std::map</i>	[in]: std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

References brathl::CIntMap::Insert(), and brathl::CIntMap::RemoveAll().

6.2.4.56 `uint32_t brathl::CUIntMap::Insert ( const std::string & key, uint32_t value, bool withExcept = true ) [virtual]`

Inserts an integer

## Parameters

<i>key</i>	: std::map key
<i>value</i>	: int value

## Returns

the inserted integer value or existing unsigned integer value if key exists

Referenced by brathl::CUIntMap::Insert().

6.2.4.57 `void brathl::CUIntMap::Insert ( const CUIntMap & m, bool bRemoveAll = true, bool withExcept = true ) [virtual]`

Inserts a **CUIntMap** (p. 331)

## Parameters

<i>std::map</i>	[in]: std::map
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

References `bratl::CUIntMap::Insert()`, and `bratl::CUIntMap::RemoveAll()`.

**6.2.4.58** `void bratl::CUIntMap::Insert ( const CStringArray & keys, uint32_t initValue, bool bRemoveAll = true, bool withExcept = true ) [virtual]`

Inserts a `CStrinArray` as keys and initial value

## Parameters

<i>keys</i>	[in]: std::map keys to insert
<i>initValue</i>	[in]: value of the keys
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

References `bratl::CUIntMap::Insert()`, and `bratl::CUIntMap::RemoveAll()`.

**6.2.4.59** `void bratl::CUIntMap::Insert ( const CStringArray & keys, const CUIntArray & values, bool bRemoveAll = true, bool withExcept = true ) [virtual]`

Inserts a `CStrinArray` as keys and a `CUIntArray` as value

## Parameters

<i>keys</i>	[in]: keys to insert
<i>values</i>	[in]: values to insert
<i>bRemoveAll</i>	[in] : if true, remove keys array element before filling the keys

References `bratl::CTools::Format()`, `bratl::CUIntMap::Insert()`, and `bratl::CUIntMap::RemoveAll()`.

**6.2.4.60** `double bratl::CDoubleMap::Insert ( const std::string & key, double value, bool withExcept = true ) [virtual]`

Inserts an double

## Parameters

<i>key</i>	: std::map key
<i>value</i>	: double value

## Returns

the inserted double value or existing double value if key exists

**6.2.4.61** `CBratObject * bratl::CObMap::Insert ( const std::string & key, CBratObject * ob, bool withExcept = true ) [virtual]`

Inserts a `CBratObject` object

## Parameters

<i>key</i>	: CBratObject name (std::map key)
<i>value</i>	: CBratObject value
<i>withExcept</i>	: true for exception handling, flse otherwise

## Returns

CBratObject object or NULL if error

Referenced by brathl::CObMap::Insert(), brathl::CDataSet::InsertFieldSet(), and brathl::CObMap::RenameKey().

6.2.4.62 `void brathl::CObMap::Insert ( const CObMap & obMap, bool withExcept = true ) [virtual]`

Inserts a **CObMap** (p. 264)

## Parameters

<i>obMap</i>	: <b>CObMap</b> (p. 264) to insert
<i>withExcept</i>	: true for exception handling, flse otherwise

References brathl::CObMap::Insert().

6.2.4.63 `CBratObject * brathl::CObIntMap::Insert ( int32_t key, CBratObject * ob, bool withExcept = true ) [virtual]`

Inserts a CBratObject object

## Parameters

<i>key</i>	: CBratObject name (std::map key)
<i>value</i>	: CBratObject value
<i>withExcept</i>	: true for exception handling, flse otherwise

## Returns

CBratObject object or NULL if error

Referenced by brathl::CObIntMap::Insert(), and brathl::CObIntMap::RenameKey().

6.2.4.64 `void brathl::CObIntMap::Insert ( const CObIntMap & obMap, bool withExcept = true ) [virtual]`

Inserts a **CObIntMap** (p. 262)

## Parameters

<i>obMap</i>	: <b>CObMap</b> (p. 264) to insert
<i>withExcept</i>	: true for exception handling, flse otherwise

References brathl::CObIntMap::Insert().

6.2.4.65 `CBratObject * brathl::CObDoubleMap::Insert ( double key, CBratObject * ob, bool withExcept = true ) [virtual]`

Inserts a CBratObject object

## Parameters

<i>key</i>	: CBratObject name (std::map key)
<i>value</i>	: CBratObject value
<i>withExcept</i>	: true for exception handling, flse otherwise

## Returns

CBratObject object or NULL if error

Referenced by brathl::CObDoubleMap::Insert(), and brathl::CObDoubleMap::RenameKey().



6.2.4.66 `void brathl::CObDoubleMap::Insert ( const CObDoubleMap & obMap, bool withExcept = true ) [virtual]`

Inserts a **CObDoubleMap** (p. 261)

#### Parameters

<i>obMap</i>	: <b>CObMap</b> (p. 264) to insert
<i>withExcept</i>	: true for exception handling, flse otherwise

References `brathl::CObDoubleMap::Insert()`.

6.2.4.67 `DoublePtr * brathl::CDoublePtrDoubleMap::Insert ( double key, DoublePtr * ob, bool withExcept = true ) [virtual]`

Inserts a `DoublePtr*` object

#### Parameters

<i>key</i>	: <code>DoublePtr*</code> name (std::map key)
<i>value</i>	: <code>DoublePtr*</code> value
<i>withExcept</i>	: true for exception handling, flse otherwise

#### Returns

`DoublePtr*` object or NULL if error

Referenced by `brathl::CDoublePtrDoubleMap::RenameKey()`.

6.2.4.68 `void * brathl::CPtrMap::Insert ( const std::string & key, void * ptr, bool withExcept = true ) [virtual]`

Inserts a pointer

#### Parameters

<i>key</i>	: keymap
<i>value</i>	: pointer value
<i>withExcept</i>	: true for exception handling, flse otherwise

#### Returns

pointer or NULL if error

Referenced by `brathl::CPtrMap::Insert()`.

6.2.4.69 `void brathl::CPtrMap::Insert ( const CPtrMap & ptrMap, bool withExcept = true ) [virtual]`

Inserts a **CPtrMap** (p. 299)

#### Parameters

<i>obMap</i>	: <b>CPtrMap</b> (p. 299) to insert
<i>withExcept</i>	: true for exception handling, flse otherwise

References `brathl::CPtrMap::Insert()`.

6.2.4.70 `std::string brathl::CStringMap::IsValue ( const std::string & value ) [virtual]`

Tests if an element value exists

## Returns

a std::string key corresponding to the value (or the first key found, if some values are the same); if exists, otherwise empty std::string

**6.2.4.71** `const CStringList & brathl::CStringList::operator= ( const CStringList & lst )` [virtual]

Copy a new **CStringList** (p. 304) to the object

Referenced by brathl::CProductList::Set().

**6.2.4.72** `const CIntList & brathl::CIntList::operator= ( const CIntList & lst )`

Copy a new **CIntList** (p. 250) to the object

**6.2.4.73** `const CObList & brathl::CObList::operator= ( const CObList & lst )` [virtual]

Copy a new **CStringList** (p. 304) to the object

References brathl::CObList::RemoveAll().

**6.2.4.74** `const CObArray & brathl::CObArray::operator= ( const CObArray & lst )` [virtual]

Copy a new **CObArray** (p. 260) to the object

References brathl::CObArray::RemoveAll().

**6.2.4.75** `int32_t brathl::CIntMap::operator[] ( const std::string & key )` [virtual]

operator[] redefinition. Searches an integer value identify by 'key'.

## Parameters

<i>key</i>	: std::string keyword
------------	-----------------------

## Returns

the interger value if found, default value **CTools::m\_defaultValueINT32** (p. 309) if not found

References brathl::CIntMap::Exists().

**6.2.4.76** `uint32_t brathl::CUIntMap::operator[] ( const std::string & key )` [virtual]

operator[] redefinition. Searches an integer value identify by 'key'.

## Parameters

<i>key</i>	: std::string keyword
------------	-----------------------

## Returns

the interger value if found, default value **CTools::m\_defaultValueUINT32** (p. 309) if not found

References brathl::CUIntMap::Exists().

**6.2.4.77** `double brathl::CDoubleMap::operator[] ( const std::string & key )` [virtual]

operator[] redefinition. Searches an integer value identify by 'key'.

## Parameters

<i>key</i>	: std::string keyword
------------	-----------------------

**Returns**

the double value if found, default value **CTools::m\_defaultValueDOUBLE** (p. 309) if not found

References bratl::CDoubleMap::Exists().

#### 6.2.4.78 CBratObject \* bratl::CObMap::operator[] ( const std::string & key ) [virtual]

operator[] redefinition. Searches a CBratObject object identify by 'key'. DON'T USE this syntax if you are not sure the key exists, there's a bug in STL, after calling 'record = m\_recordSetMap[recordSetName]', if key not existed and the std::map is empty then the key exists in the std::map and points to a NULL object CBratObject \*o = myMap[key] → use Exists method instead ;

**Parameters**

<i>key</i>	: CBratObject keyword
------------	-----------------------

**Returns**

a pointer to the CBratObject object if found, NULL if not found

#### 6.2.4.79 CBratObject \* bratl::COblntMap::operator[] ( int32\_t key ) [virtual]

operator[] redefinition. Searches a CBratObject object identify by 'key'. DON'T USE this syntax if you are not sure the key exists, there's a bug in STL, after calling 'record = m\_recordSetMap[recordSetName]', if key not existed and the std::map is empty then the key exists in the std::map and points to a NULL object CBratObject \*o = myMap[key] → use Exists method instead ;

**Parameters**

<i>key</i>	: CBratObject keyword
------------	-----------------------

**Returns**

a pointer to the CBratObject object if found, NULL if not found

#### 6.2.4.80 CBratObject \* bratl::CObDoubleMap::operator[] ( double key ) [virtual]

operator[] redefinition. Searches a CBratObject object identify by 'key'. DON'T USE this syntax if you are not sure the key exists, there's a bug in STL, after calling 'record = m\_recordSetMap[recordSetName]', if key not existed and the std::map is empty then the key exists in the std::map and points to a NULL object CBratObject \*o = myMap[key] → use Exists method instead ;

**Parameters**

<i>key</i>	: CBratObject keyword
------------	-----------------------

**Returns**

a pointer to the CBratObject object if found, NULL if not found

#### 6.2.4.81 DoublePtr \* bratl::CDoublePtrDoubleMap::operator[] ( double key ) [virtual]

operator[] redefinition. Searches a CBratObject object identify by 'key'. DON'T USE this syntax if you are not sure the key exists, there's a bug in STL, after calling 'record = m\_recordSetMap[recordSetName]', if key not existed and the std::map is empty then the key exists in the std::map and points to a NULL object CBratObject \*o = myMap[key] → use Exists method instead ;

## Parameters

<i>key</i>	: CBratObject keyword
------------	-----------------------

## Returns

a pointer to the CBratObject object if found, NULL if not found

**6.2.4.82** `void * bratl::CPtrMap::operator[] ( const std::string & key ) [virtual]`

operator[] redefinition. Searches a CBratObject object identify by 'key'. DON'T USE this syntax if you are not sure the key exists, there's a bug in STL, after calling 'record = m\_recordSetMap[recordSetName]', if key not existed and the std::map is empty then the key exists in the std::map and points to a NULL object void \*p = myMap[key] -> use Exists method instead ;

## Parameters

<i>key</i>	: CBratObject keyword
------------	-----------------------

## Returns

a pointer to the pointer if found, NULL if not found

**6.2.4.83** `void bratl::CObList::RemoveAll ( ) [virtual]`

Remove all elements and clear the std::list

Reimplemented in **bratl::CField::CListField** (p. 252).

Referenced by bratl::CObList::operator=(), bratl::CField::CListField::RemoveAll(), and bratl::CObList::~CObList().

**6.2.4.84** `void bratl::CDoublePtrArray::RemoveAll ( ) [virtual]`

Remove all elements and clear the std::list

Referenced by bratl::CDoublePtrArray::~CDoublePtrArray().

**6.2.4.85** `void bratl::CArrayDoublePtrArray::RemoveAll ( ) [virtual]`

Remove all elements and clear the std::list

**6.2.4.86** `void bratl::CArrayDoubleArray::RemoveAll ( ) [virtual]`

Remove all elements and clear the std::list

**6.2.4.87** `void bratl::CArrayStringMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the std::map

**6.2.4.88** `void bratl::CObStack::RemoveAll ( ) [virtual]`

Remove all elements and clear the std::list

References bratl::CObStack::m\_bDelete.

Referenced by bratl::CObStack::~CObStack().

**6.2.4.89** `void bratl::CObArray::RemoveAll ( ) [virtual]`

Remove all elements and clear the std::list

Reimplemented in **bratl::CDataSet** (p. 175).

Referenced by `brathl::CObArray::operator=()`, and `brathl::CObArray::~~CObArray()`.

**6.2.4.90** `void brathl::CStringMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CStringMap::~~CStringMap()`.

**6.2.4.91** `void brathl::CIntMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CIntMap::Insert()`, and `brathl::CIntMap::~~CIntMap()`.

**6.2.4.92** `void brathl::CUIntMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CUIntMap::Insert()`, and `brathl::CUIntMap::~~CUIntMap()`.

**6.2.4.93** `void brathl::CDoubleMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CDoubleMap::~~CDoubleMap()`.

**6.2.4.94** `void brathl::CObMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CDataSet::RemoveAll()`, and `brathl::CObMap::~~CObMap()`.

**6.2.4.95** `void brathl::CObIntMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CObIntMap::~~CObIntMap()`.

**6.2.4.96** `void brathl::CObDoubleMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CObDoubleMap::~~CObDoubleMap()`.

**6.2.4.97** `void brathl::CDoublePtrDoubleMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CDoublePtrDoubleMap::~~CDoublePtrDoubleMap()`.

**6.2.4.98** `void brathl::CPtrMap::RemoveAll ( ) [virtual]`

Remove all elements and clear the `std::map`

Referenced by `brathl::CPtrMap::~~CPtrMap()`.

**6.2.4.99** `bool brathl::CObMap::RenameKey ( const std::string & oldKey, const std::string & newKey )`

Rename a key

Parameters

<i>oldKey</i>	: old key
<i>newKey</i>	: new key

## Returns

true if key is renamed, otherwise false

References bratl::CObMap::Insert().

6.2.4.100 bool bratl::CObIntMap::RenameKey ( int32\_t *oldKey*, int32\_t *newKey* )

Rename a key

## Parameters

<i>oldKey</i>	: old key
<i>newKey</i>	: new key

## Returns

true if key is renamed, otherwise false

References bratl::CObIntMap::Insert().

6.2.4.101 bool bratl::CObDoubleMap::RenameKey ( double *oldKey*, double *newKey* )

Rename a key

## Parameters

<i>oldKey</i>	: old key
<i>newKey</i>	: new key

## Returns

true if key is renamed, otherwise false

References bratl::CObDoubleMap::Insert().

6.2.4.102 bool bratl::CDoublePtrDoubleMap::RenameKey ( double *oldKey*, double *newKey* )

Rename a key

## Parameters

<i>oldKey</i>	: old key
<i>newKey</i>	: new key

## Returns

true if key is renamed, otherwise false

References bratl::CDoublePtrDoubleMap::Insert().

6.2.4.103 void bratl::CArrayStringMap::Set ( const CArrayStringMap & *a* ) [virtual]

Inserts a std::string std::map

## Parameters

<i>strmap</i>	: std::map to insert
<i>withExcept</i>	: true for exception handling, flse otherwise

### Returns

the inserted std::string value or existing std::string value if key exists

### 6.2.5 Variable Documentation

#### 6.2.5.1 `const std::string brathl::UNKNOWN_PRODUCT_CLASS = "UNKNOWN"`

External files access.

### Version

1.0

## 6.3 Criteria

### Classes

- class **brathl::CCriteria**
- class **brathl::CCriteriaCycle**
- class **brathl::CCriteriaCycleInfo**
- class **brathl::CCriteriaDatetime**
- class **brathl::CCriteriaDatetimeInfo**
- class **brathl::CCriterialInfo**
- class **brathl::CCriteriaLatLon**
- class **brathl::CCriteriaLatLonInfo**
- class **brathl::CCriteriaPass**
- class **brathl::CCriteriaPassInfo**
- class **brathl::CCriteriaPassInt**
- class **brathl::CCriteriaPassIntInfo**
- class **brathl::CCriteriaPassString**
- class **brathl::CCriteriaPassStringInfo**
- class **brathl::CDataSet**
- class **brathl::CField**
- class **brathl::CFieldArray**
- class **brathl::CFieldBasic**
- class **brathl::CFieldIndexData**
- class **brathl::CFieldNetCdf**
- class **brathl::CFieldNetCdfCF**
- class **brathl::CFieldNetCdfCFAttr**
- class **brathl::CFieldRecord**
- class **brathl::CFieldSet**
- class **brathl::CFieldSetArrayDbI**
- class **brathl::CFieldSetDbI**
- class **brathl::CFieldSetString**
- class **brathl::CProduct::CInfo**
- class **brathl::CProduct::CListInfo**
- class **brathl::CMapProduct**
- class **brathl::CProductAop**
- class **brathl::CProductCryosat**
- class **brathl::CProductEnvisat**
- class **brathl::CProductErs**
- class **brathl::CProductErsWAP**
- class **brathl::CProductGfo**
- class **brathl::CProductJason**
- class **brathl::CProductJason2**
- class **brathl::CProductList**
- class **brathl::CProductNetCdf**
- class **brathl::CProductNetCdfCF**
- class **brathl::CProductPodaac**
- class **brathl::CProductRads**
- class **brathl::CProductReaper**
- class **brathl::CProductRiverLake**
- class **brathl::CProductTopex**
- class **brathl::CProductTopexSDR**
- class **brathl::CRecord**
- class **brathl::CRecordSet**
- class **brathl::CTreeField**



## Functions

- void **brathl::CProduct::AddCriteria** (bool force=false)
- void **brathl::CProduct::AddCriteria** (CCriteria \*criteria, bool erase=true)
- void **brathl::CProduct::AddCriteria** (CProduct \*product)
- void **brathl::CMapProduct::AddCriteriaToProducts** ()
- void **brathl::CProduct::AddFile** (const std::string &fileName, bool bEnd=true, bool checkFiles=true)
- void **brathl::CProduct::AddFile** (const CStringList &fileNameList, bool bEnd=true, bool checkFiles=true)
- virtual void **brathl::CProduct::AddInternalHighResolutionFieldCalculation** ()
- CInfo \* **brathl::CProduct::CListInfo::AddNew** ()
- virtual void **brathl::CProduct::AddOffset** (double value, CField \*field=NULL)
- bool **brathl::CProduct::AddRecordNameToField** (const CExpression &expr, const std::string &dataSetName, CExpression &exprOut, std::string &errorMsg)
- bool **brathl::CProduct::AddRecordNameToField** (const std::string &in, const std::string &dataSetName, std::string &out, std::string &errorMsg)
- bool **brathl::CProduct::AddRecordNameToField** (const std::string &in, const std::string &dataSetName, const CStringArray &fieldsIn, std::string &out, std::string &errorMsg)
- bool **brathl::CProduct::AddRecordNameToField** (CProductAliases \*productAliases, std::string &errorMsg)
- virtual void **brathl::CProduct::AddSameFieldName** (const std::string &fieldNameToSearch, CStringArray &arrayFieldsAdded)
- void **brathl::CCriteriaPassInt::Adjust** ()
- virtual void **brathl::CProduct::ApplyCriteria** (CStringList &filteredFileList, const std::string &logFileName="")
- virtual bool **brathl::CProduct::ApplyCriteriaCycle** (CCriterialInfo \*criterialInfo)
- virtual bool **brathl::CProduct::ApplyCriteriaDatetime** (CCriterialInfo \*criterialInfo)
- virtual bool **brathl::CProduct::ApplyCriteriaLatLon** (CCriterialInfo \*criterialInfo)
- virtual bool **brathl::CProduct::ApplyCriteriaPass** (CCriterialInfo \*criterialInfo)
- virtual bool **brathl::CProduct::ApplyCriteriaPassInt** (CCriterialInfo \*criterialInfo)
- virtual bool **brathl::CProduct::ApplyCriteriaPassString** (CCriterialInfo \*criterialInfo)
- CInfo \* **brathl::CProduct::CListInfo::Back** (bool withExcept=true)
- void **brathl::CProduct::BuildCriteriaFieldsToRead** (CRecordDataMap &listRecord)
- **brathl::CCriteriaPass::CCriteriaPass** ()  
*Empty CCriteriaPass (p. 162) ctor.*
- **brathl::CCriteriaPassInt::CCriteriaPassInt** ()  
*Empty CCriteriaPassInt (p. 166) ctor.*
- **brathl::CCriteriaPassInt::CCriteriaPassInt** (CCriteriaPassInt &c)
- **brathl::CCriteriaPassInt::CCriteriaPassInt** (CCriteriaPassInt \*c)
- **brathl::CCriteriaPassInt::CCriteriaPassInt** (int32\_t from, int32\_t to)
- **brathl::CCriteriaPassInt::CCriteriaPassInt** (const std::string &from, const std::string &to)
- **brathl::CCriteriaPassInt::CCriteriaPassInt** (const CStringArray &array)
- **brathl::CCriteriaPassString::CCriteriaPassString** ()  
*Empty CCriteriaPassString (p. 169) ctor.*
- **brathl::CCriteriaPassString::CCriteriaPassString** (CCriteriaPassString &c)
- **brathl::CCriteriaPassString::CCriteriaPassString** (CCriteriaPassString \*c)
- **brathl::CCriteriaPassString::CCriteriaPassString** (const std::string &passes, const std::string &delimiter=CCriteriaPassString::m\_delimiter)
- **brathl::CCriteriaPassString::CCriteriaPassString** (const CStringArray &array)
- static bool **brathl::CProduct::CheckAliases** (const std::string &fileName, CStringArray &errors)
- bool **brathl::CProduct::CheckAliases** (CStringArray &errors)
- virtual void **brathl::CProduct::CheckConsistencyHighResolutionField** (CFieldSetArrayDbI \*fieldSetArrayDbI)
- bool **brathl::CProduct::CheckFieldNames** (const CExpression &expr, const std::string &dataSetName, CStringArray &fieldNamesNotFound)
- bool **brathl::CProduct::CheckFieldNames** (const CExpression &expr, CStringArray &fieldNamesNotFound)

- bool **brathl::CProduct::CheckFieldNames** (const CStringArray \*fieldNames, const std::string &dataSetName, CStringArray &fieldNamesNotFound)
- void **brathl::CProduct::CheckFields** (bool convertDate=false)
- bool **brathl::CProductList::CheckFileList** ()
- virtual void **brathl::CProduct::CheckFileOpened** ()
- bool **brathl::CProductList::CheckFiles** (bool onlyFirstFile=false)
- bool **brathl::CProduct::CheckFiles** ()
- bool **brathl::CProductList::CheckFilesNetCDF** ()
- virtual CProduct \* **brathl::CProduct::Clone** ()
- virtual bool **brathl::CProduct::Close** ()
- **brathl::CMapProduct::CMapProduct** ()
- CIntMap (p. 250) ctor.*
- static void **brathl::CProduct::CodaInit** ()
- static void **brathl::CProduct::CodaRelease** ()
- static CProduct \* **brathl::CProduct::Construct** (const CStringArray &fileNameArray)
- static CProduct \* **brathl::CProduct::Construct** (CStringList &fileNameList)
- static CProduct \* **brathl::CProduct::Construct** (CProductList &fileNameList)
- static CProduct \* **brathl::CProduct::Construct** (const std::string &fileName)
- void **brathl::CProduct::ConvertDate** (CDoubleArray &vect)
- **brathl::CProduct::CProduct** ()
- Empty CProduct ctor.*
- **brathl::CProduct::CProduct** (const std::string &fileName)
- **brathl::CProduct::CProduct** (const CStringList &fileNameList)
- **brathl::CProductGeneric::CProductGeneric** ()
- Empty CProductGeneric ctor.*
- **brathl::CProductGeneric::CProductGeneric** (const std::string &fileName)
- **brathl::CProductGeneric::CProductGeneric** (const CStringList &fileNameList)
- **brathl::CProductList::CProductList** ()
- Empty CProductList (p. 281) ctor.*
- **brathl::CProductList::CProductList** (const CProductList &p)
- **brathl::CProductList::CProductList** (const std::string &fileName)
- **brathl::CProductList::CProductList** (const CStringList &fileNameList)
- **brathl::CProductList::CProductList** (const CStringArray &fileNameArray)
- void **brathl::CProduct::CreateFieldIndexData** ()
- void **brathl::CProduct::CreateFieldIndexes** (CFieldArray \*field)
- void **brathl::CProduct::CreateLogFile** (const std::string &logFileName, uint32\_t mode=CFile::modeWrite|CFile::typeText)
- std::string **brathl::CProduct::DatasetRecordsNumberToString** (const CIntMap &datasetRecordsNumber)
- void **brathl::CProduct::DeleteLogFile** ()
- virtual void **brathl::CCriteriaPass::Dump** (std::ostream &fOut=std::cerr)
- Dump fonction.*
- virtual void **brathl::CProductList::Dump** (std::ostream &fOut=std::cerr)
- Dump fonction.*
- virtual void **brathl::CCriteriaPassString::Dump** (std::ostream &fOut=std::cerr)
- Dump fonction.*
- virtual void **brathl::CCriteriaPassInt::Dump** (std::ostream &fOut=std::cerr)
- Dump fonction.*
- virtual void **brathl::CProduct::Dump** (std::ostream &fOut=std::cerr)
- Dump fonction.*
- virtual void **brathl::CMapProduct::Dump** (std::ostream &fOut=std::cerr)
- void **brathl::CProduct::DumpDictionary** (std::ostream &fOut=std::cout)
- void **brathl::CProduct::DumpDictionary** (const std::string &outputFileName)
- virtual void **brathl::CProduct::EndApplyCriteriaStats** (const CStringList &filteredFileList)

- void **brathl::CProduct::ExpandArray** ()
- void **brathl::CProduct::ExpandFieldsArray** ()
- virtual void **brathl::CProduct::ExtractDatasetNamesFromFields** (const **CStringList** &listFields, **CStringList** &datasetNames)
- static void **brathl::CCriteriaPassString::ExtractPass** (const std::string &passes, CStringArray &arrayPass, const std::string &delimiter=CCriteriaPassString::m\_delimiter)
- static void **brathl::CCriteriaPassString::ExtractPass** (const CStringArray &array, CStringArray &arrayPass)
- virtual void **brathl::CProduct::FillDescription** ()
- void **brathl::CProduct::FillListFields** (const std::string &key)
- **CField** \* **brathl::CProduct::FindFieldByInternalName** (const std::string &internalFieldName, bool withExcept=true)
- **CField** \* **brathl::CProduct::FindFieldByName** (const std::string &fieldName, const std::string &dataSetName, bool withExcept=true, std::string \*errorMsg=NULL, bool showTrace=true)
- **CField** \* **brathl::CProduct::FindFieldByName** (const std::string &fieldName, bool withExcept=true, std::string \*errorMsg=NULL, bool showTrace=true)
- virtual bool **brathl::CProduct::FindParentToRead** (**CField** \*fromField, **CObList** \*parentFieldList)
- **CInfo** \* **brathl::CProduct::CListInfo::Front** (bool withExcept=true)
- const **CProductAlias** \* **brathl::CProduct::GetAlias** (const std::string &key)
- const **CProductAliases** \* **brathl::CProduct::GetAliases** ()
- const **CStringMap** \* **brathl::CProduct::GetAliasesAsString** () const
- static const **CStringMap** \* **brathl::CProduct::GetAliasesAsString** (const **CProduct** \*product)
- std::string **brathl::CProduct::GetAliasExpandedValue** (const std::string &key)
- void **brathl::CProduct::GetAliasKeys** (CStringArray &keys)
- std::string **brathl::CCriteriaPassString::GetAsText** (const std::string &delimiter=CCriteriaPassString::m\_delimiter)
- std::string **brathl::CCriteriaPassInt::GetAsText** (const std::string &delimiter=CCriteriaPassInt::m\_delimiter)
- bool **brathl::CProduct::GetCreateVirtualField** ()
- static **CCriteriaPass** \* **brathl::CCriteriaPass::GetCriteria** (**CBratObject** \*ob, bool withExcept=true)
- static **CCriteriaPassString** \* **brathl::CCriteriaPassString::GetCriteria** (**CBratObject** \*ob, bool withExcept=true)
- **CCriteria** \* **brathl::CProduct::GetCriteria** (**CCriterialInfo** \*criterialInfo)
- static **CCriteriaPassInt** \* **brathl::CCriteriaPassInt::GetCriteria** (**CBratObject** \*ob, bool withExcept=true)
- virtual std::string **brathl::CProduct::GetCurrentFileName** ()
- virtual int32\_t **brathl::CProduct::GetCurrentRecordNumber** ()
- **CCriteriaCycle** \* **brathl::CProduct::GetCycleCriteria** ()
- **CCriteriaCycleInfo** \* **brathl::CProduct::GetCycleCriterialInfo** ()
- **CStringArray** \* **brathl::CProduct::GetDataDictionaryFieldNames** (bool forceReload=false)
- **CStringArray** \* **brathl::CProduct::GetDataDictionaryFieldNamesWithDatasetName** (bool forceReload=false)
- **CDataSet** \* **brathl::CProduct::GetDataSet** ()
- std::string **brathl::CProduct::GetDataSetNameToRead** ()
- virtual bool **brathl::CProduct::GetDateMinMax** (**CDatePeriod** &datePeriodMinMax)
- virtual bool **brathl::CProduct::GetDateMinMax** (**CDate** &dateMin, **CDate** &dateMax)
- **CCriteriaDatetime** \* **brathl::CProduct::GetDatetimeCriteria** ()
- **CCriteriaDatetimeInfo** \* **brathl::CProduct::GetDatetimeCriterialInfo** ()
- const std::string & **brathl::CProduct::GetDescription** ()
- bool **brathl::CProduct::GetDisableTrace** ()
- bool **brathl::CProduct::GetExpandArray** ()
- std::string **brathl::CProduct::GetFieldSpecificUnit** (const std::string &key)
- **CStringMap** \* **brathl::CProduct::GetFieldSpecificUnits** ()
- **CStringArray** \* **brathl::CProduct::GetFieldToTranspose** ()
- double **brathl::CProduct::GetForceLatMaxCriteriaValue** ()
- double **brathl::CProduct::GetForceLatMinCriteriaValue** ()
- virtual bool **brathl::CProduct::GetForceReadDataOneByOne** ()
- int32\_t **brathl::CCriteriaPassInt::GetFrom** ()

- `int32_t brathl::CProduct::GetIndexProcessedFile ()`
- `bool brathl::CProduct::GetInfoArray ()`
- `bool brathl::CProduct::GetInfoRecord (int32_t nbDims=1, const long dim[]=DEFAULT_DIM)`
- `bool brathl::CProduct::GetInfoSpecial (int32_t nbDims=1, const long dim[]=DEFAULT_DIM)`
- `static CMapProduct & brathl::CMapProduct::GetInstance ()`
- `virtual std::string brathl::CProduct::GetLabel ()`
- `virtual std::string brathl::CProduct::GetLatitudeFieldName ()`
- `CCriteriaLatLon * brathl::CProduct::GetLatLonCriteria ()`
- `CCriteriaLatLonInfo * brathl::CProduct::GetLatLonCriteriaInfo ()`
- `virtual bool brathl::CProduct::GetLatLonMinMax (double &latMin, double &lonMin, double &latMax, double &lonMax)`
- `virtual bool brathl::CProduct::GetLatLonMinMax (CLatLonRect &latlonRectMinMax)`
- `CStringList * brathl::CProduct::GetListFieldOrigin ()`
- `virtual std::string brathl::CProduct::GetLongitudeFieldName ()`
- `const std::string & brathl::CProductList::GetMessage () const`
- `virtual void brathl::CProduct::GetMinMaxNumberOfRecords (int32_t &min, int32_t &max, CIntMap *datasetRecordsNumber=NULL, int32_t minThreshold=-1)`
- `void brathl::CProduct::GetNamesCaseSensitive (const CStringArray &fieldsIn, CStringArray &fieldsOut-NoCaseSensitive, CStringArray &fieldsOutCaseSensitive, bool forceReload=false)`
- `virtual int32_t brathl::CProduct::GetNumberOfRecords ()`
- `virtual int32_t brathl::CProduct::GetNumberOfRecords (const std::string &dataSetName)`
- `virtual void brathl::CProduct::GetNumberOfRecords (const CStringList &datasetNames, CIntMap &datasetRecordsNumber)`
- `virtual double brathl::CProduct::GetOffset ()`
- `CCriteriaPass * brathl::CProduct::GetPassCriteria ()`
- `CCriteriaPassInfo * brathl::CProduct::GetPassCriteriaInfo ()`
- `CStringArray * brathl::CCriteriaPassString::GetPasses ()`
- `CCriteriaPassInt * brathl::CProduct::GetPassIntCriteria ()`
- `CCriteriaPassIntInfo * brathl::CProduct::GetPassIntCriteriaInfo ()`
- `CCriteriaPassString * brathl::CProduct::GetPassStringCriteria ()`
- `CCriteriaPassStringInfo * brathl::CProduct::GetPassStringCriteriaInfo ()`
- `int32_t brathl::CProduct::GetPerformBoundaryChecks ()`
- `int32_t brathl::CProduct::GetPerformConversions ()`
- `const std::string & brathl::CProduct::GetProductClass () const`
- `std::string brathl::CProduct::GetProductClassType ()`
- `void brathl::CMapProduct::GetProductKeysWithCriteria (CStringArray &keys)`
- `CProductList & brathl::CProduct::GetProductList ()`
- `std::string brathl::CProduct::GetProductType ()`
- `std::string brathl::CProduct::GetRecordFieldName ()`
- `virtual void brathl::CProduct::GetRecords (CStringArray &array)`
- `static int_t brathl::CProduct::GetRefCount ()`
- `brathl_refDate brathl::CProduct::GetRefDate ()`
- `CDate brathl::CProduct::GetRefDateAsDate ()`
- `void brathl::CProduct::GetRootType ()`
- `uint32_t brathl::CProduct::GetSkippedRecordCount ()`
- `int32_t brathl::CCriteriaPassInt::GetTo ()`
- `CTreeField * brathl::CProduct::GetTreeField ()`
- `std::string brathl::CProduct::GetTypeDesc ()`
- `std::string brathl::CProduct::GetTypeDesc (coda_Type *type)`
- `std::string brathl::CProduct::GetTypeNames ()`
- `std::string brathl::CProduct::GetTypeUnit ()`
- `virtual bool brathl::CProduct::GetValueMinMax (CExpression &expr, const std::string &recordName, double &valueMin, double &valueMax, const CUnit &unit)`
- `static void brathl::CProduct::GroupAliases (const CProduct *product, const CStringMap *formulaAliases, CStringMap &allAliases)`

- void **brathl::CProduct::HandleBratError** (const std::string &str="", int32\_t errClass=BRATHL\_LOGIC\_ERROR)
- virtual bool **brathl::CProduct::HasAliases** ()
- virtual bool **brathl::CProduct::HasCompatibleDims** (const std::string &value, std::string &msg, bool useVirtualDims, CUIntArray \*commonDimensions=NULL)
- virtual bool **brathl::CProduct::HasCompatibleDims** (const std::string &value, const std::string &dataSetName, std::string &msg, bool useVirtualDims, CUIntArray \*commonDimensions=NULL)
- virtual bool **brathl::CProduct::HasCompatibleDims** (const CExpression &expr, std::string &msg, bool useVirtualDims, CUIntArray \*commonDimensions=NULL)
- virtual bool **brathl::CProduct::HasCompatibleDims** (const CExpression &expr, const std::string &dataSetName, std::string &msg, bool useVirtualDims, CUIntArray \*commonDimensions=NULL)
- virtual bool **brathl::CProduct::HasCompatibleDims** (const CStringArray \*fieldNames, std::string &msg, bool useVirtualDims, CUIntArray \*commonDimensions=NULL)
- virtual bool **brathl::CProduct::HasCompatibleDims** (const CStringArray \*fieldNames, const std::string &dataSetName, std::string &msg, bool useVirtualDims, CUIntArray \*commonDimensions=NULL)
- virtual bool **brathl::CProduct::HasCriterialInfo** ()
- bool **brathl::CProduct::HasCycleCriteria** ()
- bool **brathl::CProduct::HasCycleCriterialInfo** ()
- bool **brathl::CProduct::HasDatetimeCriteria** ()
- bool **brathl::CProduct::HasDatetimeCriterialInfo** ()
- bool **brathl::CProduct::HasEqualDims** (const std::string &value, std::string &msg)
- bool **brathl::CProduct::HasEqualDims** (const std::string &value, const std::string &dataSetName, std::string &msg)
- bool **brathl::CProduct::HasEqualDims** (const CExpression &expr, std::string &msg)
- bool **brathl::CProduct::HasEqualDims** (const CExpression &expr, const std::string &dataSetName, std::string &msg)
- bool **brathl::CProduct::HasEqualDims** (const CStringArray \*fieldNames, std::string &msg)
- bool **brathl::CProduct::HasEqualDims** (const CStringArray \*fieldNames, const std::string &dataSetName, std::string &msg)
- bool **brathl::CProduct::HasEqualsNumberOfRecord** (const CIntMap &datasetRecordsNumber)
- virtual bool **brathl::CProduct::HasHighResolutionFieldCalculation** ()
- bool **brathl::CProduct::HasLatLonCriteria** ()
- bool **brathl::CProduct::HasLatLonCriterialInfo** ()
- bool **brathl::CProduct::HasPassCriteria** ()
- bool **brathl::CProduct::HasPassCriterialInfo** ()
- bool **brathl::CProduct::HasPassIntCriteria** ()
- bool **brathl::CProduct::HasPassIntCriterialInfo** ()
- bool **brathl::CProduct::HasPassStringCriteria** ()
- bool **brathl::CProduct::HasPassStringCriterialInfo** ()
- void **brathl::CCriteriaPass::Init** ()
- void **brathl::CCriteriaPassString::Init** ()
- void **brathl::CCriteriaPassInt::Init** ()
- void **brathl::CMapProduct::Init** ()
- virtual void **brathl::CProduct::InitApplyCriteriaStats** ()
- virtual void **brathl::CProduct::InitCriterialInfo** ()
- virtual void **brathl::CProduct::InitDateRef** ()=0
- virtual void **brathl::CProductGeneric::InitDateRef** ()
- virtual void **brathl::CProduct::InitInternalFieldName** (const std::string &dataSetName, CStringList &listField, bool convertDate=false)
- virtual void **brathl::CProduct::InitInternalFieldName** (CStringList &listField, bool convertDate=false)
- virtual void **brathl::CProduct::InitInternalFieldName** (const std::string &field, bool convertDate=false)
- void **brathl::CProduct::InsertRecord** (int32\_t pos)
- void **brathl::CProduct::InsertRecord** (CDataSet &dataSet, int32\_t pos)
- bool **brathl::CCriteriaPassString::Intersect** (const std::string &passes, CStringArray &intersect)
- bool **brathl::CCriteriaPassString::Intersect** (CStringArray &passes, CStringArray &intersect)

- bool **brathl::CCriteriaPassInt::Intersect** (CStringArray &array, CStringArray &intersect)
- bool **brathl::CCriteriaPassInt::Intersect** (CStringArray &array, CIntArray &intersect)
- bool **brathl::CCriteriaPassInt::Intersect** (CIntArray &array, CStringArray &intersect)
- bool **brathl::CCriteriaPassInt::Intersect** (CIntArray &array, CIntArray &intersect)
- bool **brathl::CCriteriaPassInt::Intersect** (int32\_t from, int32\_t to, CStringArray &intersect)
- bool **brathl::CCriteriaPassInt::Intersect** (int32\_t from, int32\_t to, CIntArray &intersect)
- bool **brathl::CCriteriaPassInt::Intersect** (double otherFrom, double otherTo, CIntArray &intersect)
- bool **brathl::CCriteriaPassInt::Intersect** (const std::string &from, const std::string &to, CIntArray &intersect)
- bool **brathl::CCriteriaPassInt::Intersect** (const std::string &from, const std::string &to, CStringArray &intersect)
- bool **brathl::CProductList::IsATP** () const
- virtual bool **brathl::CCriteriaPass::IsDefaultValue** ()=0
- bool **brathl::CCriteriaPassString::IsDefaultValue** ()
- bool **brathl::CCriteriaPassInt::IsDefaultValue** ()
- bool **brathl::CProductList::IsGenericNetCdf** () const
- bool **brathl::CProductList::IsHdfOrNetcdfCodaFormat** ()
- static bool **brathl::CProductList::IsHdfOrNetcdfCodaFormat** (coda\_format format)
- virtual bool **brathl::CProduct::IsHighResolutionField** (CField \*)
- bool **brathl::CProductList::IsJason2** () const
- virtual bool **brathl::CProduct::IsLatitudeFieldName** (const std::string &name) const
- virtual bool **brathl::CProduct::IsLongitudeFieldName** (const std::string &name) const
- bool **brathl::CProduct::IsNetCdf** ()
- bool **brathl::CProductList::IsNetCdfCFProduct** () const
- bool **brathl::CProduct::IsNetCdfCFProduct** ()
- bool **brathl::CProductList::IsNetCdfOrNetCdfCFProduct** () const
- bool **brathl::CProduct::IsNetCdfOrNetCdfCFProduct** ()
- bool **brathl::CProductList::IsNetCdfProduct** () const
- bool **brathl::CProduct::IsNetCdfProduct** ()
- virtual bool **brathl::CProduct::IsOpened** ()
- virtual bool **brathl::CProduct::IsOpened** (const std::string &fileName)
- bool **brathl::CProductList::IsSameProduct** (const std::string &productClass, const std::string &productType)
- bool **brathl::CProduct::IsSameProduct** (const CProductList fileList)
- bool **brathl::CProduct::IsSameProduct** (const std::string &productClass, const std::string &productType)
- bool **brathl::CProduct::IsSetCycleCriteria** ()
- bool **brathl::CProduct::IsSetDatetimeCriteria** ()
- bool **brathl::CProduct::IsSetLatLonCriteria** ()
- bool **brathl::CProduct::IsSetPassCriteria** ()
- bool **brathl::CProduct::IsSetPassIntCriteria** ()
- bool **brathl::CProduct::IsSetPassStringCriteria** ()
- bool **brathl::CProductList::IsYFX** ()
- bool **brathl::CProductList::IsZFX** ()
- virtual void **brathl::CProduct::LoadAliases** ()
- virtual void **brathl::CProduct::LoadFieldsInfo** ()
- bool **brathl::CProduct::LoadTransposeFieldsValue** (CStringArray &fieldsToTranspose)
- template<typename T >  
void **brathl::CProduct::Log** (const T n, bool bCrLf)
- void **brathl::CProduct::Log** (const char \*str, bool bCrLf)
- void **brathl::CProduct::Log** (const std::string &str, bool bCrLf)
- void **brathl::CProduct::Log** (const bool n, bool bCrLf)
- void **brathl::CProduct::Log** (const CStringList &l, bool bCrLf)
- void **brathl::CProduct::LogSelectionResult** (const std::string &fileName, bool result)
- virtual std::string **brathl::CProduct::MakeInternalDataSetName** (const std::string &dataSetName)
- virtual std::string **brathl::CProduct::MakeInternalFieldName** (const std::string &dataSetName, const std::string &field)

- virtual std::string **brathl::CProduct::MakeInternalFieldName** (const std::string &field)
- virtual std::string **brathl::CProduct::MakeInternalNameByAddingRoot** (const std::string &name)
- virtual bool **brathl::CProduct::Open** (const std::string &fileName, const std::string &dataSetName, **CStringList** &listFieldToRead, bool convertDate=false)
- virtual bool **brathl::CProduct::Open** (const std::string &fileName, const std::string &dataSetName)
- virtual bool **brathl::CProduct::Open** (const std::string &fileName)
- virtual bool **brathl::CProduct::Open** ()
- const **CProductList** & **brathl::CProductList::operator=** (const **CProductList** &lst)
- const **CCriteriaPassString** & **brathl::CCriteriaPassString::operator=** (**CCriteriaPassString** &c)
- const **CCriteriaPassInt** & **brathl::CCriteriaPassInt::operator=** (**CCriteriaPassInt** &c)
- CInfo \* **brathl::CProduct::CListInfo::PrevBack** (bool withExcept=true)
- void **brathl::CProduct::ProcessHighResolution** ()
- virtual void **brathl::CProduct::ProcessHighResolutionWithFieldCalculation** ()
- virtual void **brathl::CProduct::ProcessHighResolutionWithoutFieldCalculation** ()
- virtual void **brathl::CProduct::Put** (**CDataSet** \*dataSet, **CFieldSetDbI** \*fieldSetDbI, uint32\_t repeat, uint32\_t insertRecordAt=0)
- virtual void **brathl::CProduct::Put** (**CDataSet** \*dataSet, **CFieldSetArrayDbI** \*fieldSetArrayDbI, uint32\_t repeat, uint32\_t insertRecordAt=0)
- virtual void **brathl::CProduct::Put** (**CDataSet** \*dataSet, **CFieldSetDbI** \*fieldSetDbI)
- virtual void **brathl::CProduct::PutFlat** (**CDataSet** \*dataSet, **CFieldSetArrayDbI** \*fieldSetArrayDbI, uint32\_t insertRecordAt=0)
- virtual void **brathl::CProduct::PutFlatHighResolution** (**CDataSet** \*dataSet, **CFieldSetArrayDbI** \*fieldSetArrayDbI)
- virtual void **brathl::CProduct::ReadBratFieldRecord** (const std::string &key, int32\_t iRecord)
- virtual void **brathl::CProduct::ReadBratFieldRecord** (**CField::CListField::iterator** it)
- virtual void **brathl::CProduct::ReadBratFieldRecord** (**CField::CListField::iterator** it, bool &skipRecord)
- virtual void **brathl::CProduct::ReadBratRecord** (const std::string &dataSetName, const std::string &field, int32\_t iRecord)
- virtual void **brathl::CProduct::ReadBratRecord** (const std::string &dataSetName, **CStringList** &listField, int32\_t iRecord)
- virtual void **brathl::CProduct::ReadBratRecord** (int32\_t iRecord)
- static int32\_t **brathl::CProduct::ReadData** (int32\_t nbFiles, char \*\*fileNames, const char \*recordName, const char \*selection, int32\_t nbData, char \*\*dataExpressions, char \*\*units, double \*\*results, int32\_t sizes[], size\_t \*actualSize, int ignoreOutOfRange, int statistics, double defaultValue, **CStringMap** \*fieldSpecificUnit=NULL)
- static void **brathl::CProduct::ReadDataForOneMeasure** (**CDataSet** \*dataSet, const std::string &recordName, **CExpression** &Select, std::vector< **CExpression** > &Expressions, const std::vector< **CUnit** > &WantedUnits, double \*\*results, int32\_t \*sizes, size\_t \*actualSize, int ignoreOutOfRange, int statistics, **CProduct** \*product=NULL)
- void **brathl::CProduct::RemoveCriteria** ()
- void **brathl::CMapProduct::RemoveCriteriaFromProducts** ()
- void **brathl::CProduct::RemoveUnusedFields** ()
- void **brathl::CProduct::ReplaceNamesCaseSensitive** (const **CExpression** &exprIn, const **CStringArray** &fieldsIn, **CExpression** &exprOut, bool forceReload=false)
- void **brathl::CProduct::ReplaceNamesCaseSensitive** (const std::string &in, const **CStringArray** &fieldsIn, std::string &out, bool forceReload=false)
- void **brathl::CProduct::ReplaceNamesCaseSensitive** (const std::string &in, std::string &out, bool forceReload=false)
- void **brathl::CProduct::ReplaceNamesCaseSensitive** (const **CExpression** &exprIn, std::string &out, bool forceReload=false)
- virtual void **brathl::CProduct::Rewind** ()
- virtual void **brathl::CProduct::RewindEnd** ()
- virtual void **brathl::CProduct::RewindInit** ()
- virtual void **brathl::CProduct::RewindProcess** ()
- void **brathl::CProductList::Set** (const **CProductList** &lst)

- void **brathl::CCriteriaPassString::Set** (const std::string &passes, const std::string &delimiter=CCriteriaPassString::m\_delimiter)
- void **brathl::CCriteriaPassString::Set** (const CStringArray &array)
- void **brathl::CCriteriaPassString::Set** (CCriteriaPassString &c)
- void **brathl::CCriteriaPassInt::Set** (CCriteriaPassInt &c)
- void **brathl::CCriteriaPassInt::Set** (int32\_t from, int32\_t to)
- void **brathl::CCriteriaPassInt::Set** (const std::string &from, const std::string &to)
- void **brathl::CCriteriaPassInt::Set** (const CStringArray &array)
- void **brathl::CProduct::SetCreateVirtualField** (bool value)
- void **brathl::CProduct::SetCursor** (CField \*field, bool &skipRecord)
- void **brathl::CProduct::SetDataSetNameToRead** (const std::string &value)
- virtual void **brathl::CCriteriaPass::SetDefaultValue** ()=0
- void **brathl::CCriteriaPassString::SetDefaultValue** ()
- void **brathl::CCriteriaPassInt::SetDefaultValue** ()
- void **brathl::CProduct::SetDescription** (const std::string &value)
- void **brathl::CProduct::SetDisableTrace** (bool value)
- void **brathl::CProduct::SetDynInfo** ()
- void **brathl::CProduct::SetExpandArray** (bool value)
- void **brathl::CProduct::SetFieldSpecificUnit** (const std::string &key, const std::string &value)
- virtual void **brathl::CProduct::SetFieldSpecificUnit** (CField \*field)
- void **brathl::CProduct::SetFieldSpecificUnits** (const CStringMap &fieldSpecificUnit)
- virtual void **brathl::CProduct::SetForceReadDataOneByOne** (bool)
- void **brathl::CCriteriaPassInt::SetFrom** (int32\_t from)
- void **brathl::CCriteriaPassInt::SetFrom** (const std::string &from)
- void **brathl::CCriteriaPassInt::SetFromText** (const std::string &values, const std::string &delimiter=C-CriteriaPassInt::m\_delimiter)
- virtual void **brathl::CProduct::SetHighResolution** (CField \*field)
- void **brathl::CProduct::SetIndex** (CField \*field)
- virtual void **brathl::CProduct::SetLabel** (const std::string &value)
- void **brathl::CProduct::SetListFieldOrigin** (const CStringList &listFieldOrigin)
- void **brathl::CProduct::SetListFieldToRead** (CStringList &listFieldToRead, bool convertDate=false)
- void **brathl::CProduct::SetNativeType** (CField \*field)
- virtual void **brathl::CProduct::SetOffset** (double value)
- void **brathl::CProduct::SetPerformBoundaryChecks** (bool performBoundaryChecks)
- void **brathl::CProduct::SetPerformConversions** (bool performConversions)
- void **brathl::CProduct::SetProductList** (const std::string &fileName, bool checkFiles=true)
- void **brathl::CProduct::SetProductList** (const CStringList &fileList, bool checkFiles=true)
- void **brathl::CProduct::SetSpecialType** (CField \*field)
- void **brathl::CCriteriaPassInt::SetTo** (int32\_t to)
- void **brathl::CCriteriaPassInt::SetTo** (const std::string &to)
- void **brathl::CProduct::SetTypeClass** (CField \*field)
- void **brathl::CProduct::SetUnion** (CField \*field)
- bool **brathl::CProduct::TraverseData** ()
- bool **brathl::CProduct::TraverseRecord** (int32\_t indexFields)
- virtual **brathl::CCriteriaPass::~~CCriteriaPass** ()
- Destructor.*
- virtual **brathl::CCriteriaPassInt::~~CCriteriaPassInt** ()
- Destructor.*
- virtual **brathl::CCriteriaPassString::~~CCriteriaPassString** ()
- Destructor.*
- virtual **brathl::CMapProduct::~~CMapProduct** ()
- CIntMap* (p. 250) *dtor.*
- virtual **brathl::CProduct::~~CProduct** ()
- Destructor.*



- virtual **brathl::CProductGeneric::~~CProductGeneric ()**  
*Destructor.*
- virtual **brathl::CProductList::~~CProductList ()**  
*Destructor.*

#### Variables

- static const uint32\_t **brathl::CProduct::COUNT\_INDEX = 0**
- const long **brathl::DEFAULT\_DIM [] = {1}**
- CStringArray **brathl::CProduct::m\_arrayLatitudeFieldName**
- CStringArray **brathl::CProduct::m\_arrayLongitudeFieldName**
- static coda\_array\_ordering **brathl::CProduct::m\_arrayOrdering = coda\_array\_ordering\_c**
- uint32\_t **brathl::CProduct::m\_countForTrace**
- bool **brathl::CProduct::m\_createVirtualField**
- COblntMap **brathl::CProduct::m\_criterialInfoMap**
- COblntMap **brathl::CProduct::m\_criteriaMap**
- int32\_t **brathl::CProduct::m\_currentRecord**
- coda\_ProductFile \* **brathl::CProduct::m\_currFile**
- std::string **brathl::CProduct::m\_currFileName**
- coda\_Cursor **brathl::CProduct::m\_cursor**
- CStringArray **brathl::CProduct::m\_dataDictionaryFieldNames**
- CStringArray **brathl::CProduct::m\_dataDictionaryFieldNamesWithDatasetName**
- CDataSet **brathl::CProduct::m\_dataSet**
- std::string **brathl::CProduct::m\_dataSetNameToRead**
- CDate **brathl::CProduct::m\_dateProcessBegin**
- CDate **brathl::CProduct::m\_dateProcessEnd**
- static const std::string **brathl::CCriteriaPassString::m\_delimiter = ","**
- static const std::string **brathl::CCriteriaPassInt::m\_delimiter = " "**
- double **brathl::CProduct::m\_deltaTimeHighResolution**
- std::string **brathl::CProduct::m\_description**
- bool **brathl::CProduct::m\_disableTrace**
- bool **brathl::CProduct::m\_expandArray**
- std::string **brathl::CProduct::CInfo::m\_fieldName**
- CStringMap **brathl::CProduct::m\_fieldNameEquivalence**
- bool **brathl::CProduct::m\_fieldsHaveDefaultValue**
- CStringMap **brathl::CProduct::m\_fieldSpecificUnit**
- CStringList **brathl::CProduct::m\_fieldsToProcess**
- CStringArray **brathl::CProduct::m\_fieldsToTranspose**
- CProductList **brathl::CProduct::m\_fileList**
- double **brathl::CProduct::m\_forceLatMaxCriteriaValue**
- double **brathl::CProduct::m\_forceLatMinCriteriaValue**
- int32\_t **brathl::CCriteriaPassInt::m\_from**
- bool **brathl::CProduct::m\_hasHighResolutionFieldToProcess**
- int32\_t **brathl::CProduct::CInfo::m\_index**
- int32\_t **brathl::CProduct::m\_indexProcessedFile**
- int32\_t **brathl::CProduct::CInfo::m\_isUnion**
- std::string **brathl::CProduct::m\_label**
- std::string **brathl::CProduct::m\_latitudeFieldName**
- CStringList **brathl::CProduct::m\_listFieldExpandArray**
- CStringList **brathl::CProduct::m\_listFieldOrigin**
- CField::CListField **brathl::CProduct::m\_listFields**
- CListInfo **brathl::CProduct::m\_listInfo**
- CStringList **brathl::CProduct::m\_listInternalFieldName**
- CFile \* **brathl::CProduct::m\_logFile**

- `std::string brathl::CProduct::m_longitudeFieldName`
- `CStringMap brathl::CProduct::m_mapStringAliases`
- `std::string brathl::CProductList::m_message`
- `int32_t brathl::CProduct::m_nbRecords`
- `uint32_t brathl::CProduct::m_nSkippedRecord`
- `uint32_t brathl::CProduct::m_numHighResolutionMeasure`
- `double brathl::CProduct::m_offset`
- `CStringArray brathl::CCriteriaPassString::m_passes`
- `double brathl::CProduct::m_previousLatitude`
- `double brathl::CProduct::m_previousLongitude`
- `double brathl::CProduct::m_previousTimeStamp`
- `CProductAliases * brathl::CProduct::m_productAliases`
- `std::string brathl::CProductList::m_productClass`
- `coda_format brathl::CProductList::m_productFormat`
- `std::string brathl::CProductList::m_productType`
- `size_t brathl::CProduct::m_recordCount`
- `brathl_refDate brathl::CProduct::m_refDate`
- `int32_t brathl::CProduct::m_refPoint`
- `int32_t brathl::CCriteriaPassInt::m_to`
- `uint32_t brathl::CProduct::m_traceProcessRecordRatio`
- `static const char * brathl::CProduct::m_transposeFieldValuesFileName = "brathl_transposefieldvalues.txt"`
- `CTreeField brathl::CProduct::m_tree`
- `static const std::string brathl::CProduct::m_treeRootName = "Root"`
- `coda_Type * brathl::CProduct::CInfo::m_type`
- `coda_type_class brathl::CProduct::CInfo::m_type_class`
- `static const uint32_t brathl::CProduct::MAX_INDEX = 4`
- `static const uint32_t brathl::CProduct::MEAN_INDEX = 1`
- `static const uint32_t brathl::CProduct::MIN_INDEX = 3`
- `static const int32_t brathl::CProduct::NUMBER_OF_STATISTICS = 5`
- `static const uint32_t brathl::CProduct::STDDEV_INDEX = 2`

### 6.3.1 Detailed Description

### 6.3.2 Function Documentation

#### 6.3.2.1 `brathl::CCriteriaPassInt::CCriteriaPassInt ( int32_t from, int32_t to )`

Constructor.

Parameters

<i>from</i>	start pass
<i>to</i>	end pass

#### 6.3.2.2 `brathl::CCriteriaPassInt::CCriteriaPassInt ( const std::string & from, const std::string & to )`

Constructor.

Parameters

<i>from</i>	start pass
<i>to</i>	end pass

### 6.3.2.3 bratl::CCriteriaPassInt::CCriteriaPassInt ( const CStringArray & array )

Constructor from a array that contains start pass as std::string, end pass as std::string

#### Parameters

<i>array</i>	start and end dates
--------------	---------------------

### 6.3.2.4 bratl::CCriteriaPassString::CCriteriaPassString ( const std::string & passes, const std::string & delimiter = CCriteriaPassString::m\_delimiter )

Constructor from a std::string that contains passes delimited by a comma)

#### Parameters

<i>passes</i>	passes to set
---------------	---------------

### 6.3.2.5 bratl::CCriteriaPassString::CCriteriaPassString ( const CStringArray & array )

Constructor from a array that contains passes

#### Parameters

<i>array</i>	start and end dates
--------------	---------------------

### 6.3.2.6 bratl::CProduct::CProduct ( const std::string & fileName )

Creates new CProduct object

#### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

### 6.3.2.7 bratl::CProduct::CProduct ( const CStringList & fileNameList )

Creates new CProduct object

#### Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

### 6.3.2.8 bratl::CProductGeneric::CProductGeneric ( const std::string & fileName ) [inline]

Creates new CProdCProductGenericuct object

#### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

### 6.3.2.9 bratl::CProductGeneric::CProductGeneric ( const CStringList & fileNameList ) [inline]

Creates new CProductGeneric object

#### Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

6.3.2.10 `brathl::CProductList::CProductList ( const CProductList & p )`

Creates new **CProductList** (p. 281) object from another one

## Parameters

<i>p</i>	[in] : productList object to be connected
----------	---

6.3.2.11 `brathl::CProductList::CProductList ( const std::string & fileName )`

Creates new **CProductList** (p. 281) object

## Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

6.3.2.12 `brathl::CProductList::CProductList ( const CStringList & fileNameList )`

Creates new CProduct object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

6.3.2.13 `brathl::CProductList::CProductList ( const CStringArray & fileNameArray )`

Creates new CProduct object

## Parameters

<i>fileNameArray</i>	[in] : array of file to be connected
----------------------	--------------------------------------

6.3.2.14 `bool brathl::CCriteriaPassString::Intersect ( const std::string & passes, CStringArray & intersect )`

Creates the intersection of these passes with the given onee

## Parameters

<i>passes</i>	intersect with this
<i>intersect</i>	intersection passes

## Returns

true, or false if there is no intersection

6.3.2.15 `bool brathl::CCriteriaPassString::Intersect ( CStringArray & passes, CStringArray & intersect )`

Creates the intersection of these passes with the given onee

## Parameters

<i>passes</i>	intersect with this
<i>intersect</i>	intersection passes

## Returns

true, or false if there is no intersection

**6.3.2.16** `bool brathl::CCriteriaPassInt::Intersect ( CStringArray & array, CStringArray & intersect )`

Create the intersection of this date period with the given one

**Parameters**

<i>array</i>	that contains start pass as std::string, end pass as std::string
<i>intersect</i>	intersection period

**Returns**

true, or false if there is no intersection

**6.3.2.17** `bool brathl::CCriteriaPassInt::Intersect ( CStringArray & array, CIntArray & intersect )`

Create the intersection of this date period with the given one

**Parameters**

<i>array</i>	that contains start pass as std::string, end pass as std::string
<i>intersect</i>	intersection period

**Returns**

true, or false if there is no intersection

**6.3.2.18** `bool brathl::CCriteriaPassInt::Intersect ( CIntArray & array, CStringArray & intersect )`

Create the intersection of this date period with the given one

**Parameters**

<i>array</i>	that contains start pass as std::string, end pass as std::string
<i>intersect</i>	intersection period

**Returns**

true, or false if there is no intersection

**6.3.2.19** `bool brathl::CCriteriaPassInt::Intersect ( CIntArray & array, CIntArray & intersect )`

Create the intersection of this date period with the given one

**Parameters**

<i>array</i>	that contains start pass as std::string, end pass as std::string
<i>intersect</i>	intersection period

**Returns**

true, or false if there is no intersection

**6.3.2.20** `virtual bool brathl::CCriteriaPass::IsDefaultValue ( ) [pure virtual]`

Tests whether date period have been initialized or not

**Returns**

true if not initialized

Implements **brathl::CCriteria** (p. 140).

Implemented in **brathl::CCriteriaPassInt** (p. 60), and **brathl::CCriteriaPassString** (p. 60).

**6.3.2.21** `bool brathl::CCriteriaPassString::IsDefaultValue ( ) [virtual]`

Tests whether passes have been initialized or not

**Returns**

true if not initialized

Implements **brathl::CCriteriaPass** (p. 59).

**6.3.2.22** `bool brathl::CCriteriaPassInt::IsDefaultValue ( ) [virtual]`

Tests whether the pass have been initialized or not

**Returns**

true if not initialized

Implements **brathl::CCriteriaPass** (p. 59).

**6.3.2.23** `virtual bool brathl::CProduct::IsHighResolutionField ( CField * ) [inline],[virtual]`

Determines if a field object is a 'high resolution' array data see classes derived from CProduct.

**6.3.2.24** `void brathl::CProductList::Set ( const CProductList & lst )`

Creates new **CProductList** (p. 281) object from another one

**Parameters**

<i>p</i>	[in] : productList object to be connected
----------	---

References **brathl::CStringList::operator=()**.

**6.3.2.25** `void brathl::CCriteriaPassString::Set ( const std::string & passes, const std::string & delimiter = CCriteriaPassString::m_delimiter )`

Sets one or more passes from a std::string (delimited by a comma)

**Parameters**

<i>passes</i>	passes to set
---------------	---------------

**6.3.2.26** `void brathl::CCriteriaPassString::Set ( const CStringArray & array )`

Sets passes from a array

**Parameters**

<i>array</i>	array of passes
--------------	-----------------

#### 6.3.2.27 void brathl::CCriteriaPassInt::Set ( int32\_t from, int32\_t to )

Sets date period from start and end pass

##### Parameters

<i>from</i>	start pass
<i>to</i>	end pass

#### 6.3.2.28 void brathl::CCriteriaPassInt::Set ( const std::string & from, const std::string & to )

Sets date period from start and end pass

##### Parameters

<i>from</i>	start pass
<i>to</i>	end pass

References brathl::CTools::StrToInt32().

#### 6.3.2.29 void brathl::CCriteriaPassInt::Set ( const CStringArray & array )

Sets a date period from a array that contains start pass as std::string, end pass as std::string

##### Parameters

<i>array</i>	start and end dates
--------------	---------------------

#### 6.3.2.30 virtual void brathl::CCriteriaPass::SetDefaultValue ( ) [pure virtual]

Sets internal value to the default value (uninitialized)

Implements **brathl::CCriteria** (p. 140).

Implemented in **brathl::CCriteriaPassInt** (p. 61), and **brathl::CCriteriaPassString** (p. 61).

#### 6.3.2.31 void brathl::CCriteriaPassString::SetDefaultValue ( ) [virtual]

Sets internal value to the default value (uninitialized)

Implements **brathl::CCriteriaPass** (p. 61).

#### 6.3.2.32 void brathl::CCriteriaPassInt::SetDefaultValue ( ) [virtual]

Sets internal value to the default value (uninitialized)

Implements **brathl::CCriteriaPass** (p. 61).

#### 6.3.2.33 void brathl::CCriteriaPassInt::SetFrom ( int32\_t from )

Sets start pass

##### Parameters

<i>to</i>	start pass
-----------	------------

#### 6.3.2.34 void brathl::CCriteriaPassInt::SetFrom ( const std::string & from )

Sets start pass

## Parameters

<i>to</i>	start pass
-----------	------------

References bratl::CTools::StrToInt32().

6.3.2.35 void bratl::CCriteriaPassInt::SetTo ( int32\_t *to* )

Sets end pass

## Parameters

<i>to</i>	end pass
-----------	----------

6.3.2.36 void bratl::CCriteriaPassInt::SetTo ( const std::string & *to* )

Sets end pass

## Parameters

<i>to</i>	end pass
-----------	----------

References bratl::CTools::StrToInt32().

## 6.3.3 Variable Documentation

6.3.3.1 const long bratl::DEFAULT\_DIM[] = {1}

Product management class.

## Version

1.0

6.3.3.2 int32\_t bratl::CCriteriaPassInt::m\_from [protected]

start pass

6.3.3.3 int32\_t bratl::CProduct::m\_nbRecords [protected]

Number of records to read

6.3.3.4 CStringArray bratl::CCriteriaPassString::m\_passes [protected]

Date period

6.3.3.5 int32\_t bratl::CCriteriaPassInt::m\_to [protected]

end pass



## 6.4 Date conversion classes

### Classes

- class **brathl::CDate**
- class **brathl::CDatePeriod**
- class **brathl::CMission**

### 6.4.1 Detailed Description

## 6.5 File services

### Classes

- class **brathl::CFile**

### 6.5.1 Detailed Description

## 6.6 Parameters

### Classes

- class **brathl::CFileParams**
- class **brathl::CMapParameter**
- class **brathl::CParameter**

### Functions

- **brathl::CMapParameter::CMapParameter ()**  
*CMapParameter* (p. 254) ctor.
- virtual void **brathl::CMapParameter::Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- bool **brathl::CMapParameter::Erase** (CMapParameter::iterator iteratorParameter)
- bool **brathl::CMapParameter::Erase** (const std::string &key)
- **CParameter \* brathl::CMapParameter::Exists** (const std::string &key)
- **CParameter \* brathl::CMapParameter::Insert** (const std::string &key, const std::string &value)
- **CParameter \* brathl::CMapParameter::operator[]** (const std::string key)
- void **brathl::CMapParameter::RemoveAll** ()
- virtual **brathl::CMapParameter::~~CMapParameter** ()  
*CMapParameter* (p. 254) dtor.

#### 6.6.1 Detailed Description

#### 6.6.2 Function Documentation

##### 6.6.2.1 bool brathl::CMapParameter::Erase ( CMapParameter::iterator *iteratorParameter* )

Delete an element referenced by *iteratorMnemo*

#### Returns

true if no error, otherwise false

##### 6.6.2.2 bool brathl::CMapParameter::Erase ( const std::string & *key* )

Delete an element by its key

#### Returns

true if no error, otherwise false

##### 6.6.2.3 CParameter \* brathl::CMapParameter::Exists ( const std::string & *key* )

Tests if an element identify by 'key' already exists

#### Returns

a **CParameter** (p. 265) pointer if exists, otherwise NULL

Referenced by **brathl::CFileParams::CheckCount()**.

**6.6.2.4 CParameter \* brathl::CMapParameter::Insert ( const std::string & key, const std::string & value )**

Inserts a **CParameter** (p. 265) object

**Parameters**

<i>key</i>	: parameter name (std::map key)
<i>value</i>	: parameter value

**Returns**

**CParameter** (p. 265) object or NULL if error

References brathl::CParameter::AddValue().

**6.6.2.5 CParameter \* brathl::CMapParameter::operator[] ( const std::string key )**

operator[] redefinition. Searches a **CParameter** (p. 265) object identify by 'key'. DON'T USE this syntax if you are not sure the key exists, there's a bug in STL, after calling 'record = m\_recordSetMap[recordSetName]', if key not existed and the std::map is empty then the key exists in the std::map and points to a NULL object **CParameter** (p. 265) \*p = m\_mapParam[key] -> use Exists method instead ;

**Parameters**

<i>key</i>	: parameter keyword
------------	---------------------

**Returns**

a pointer to th **CParameter** (p. 265) object if found, NULL if not found

**6.6.2.6 void brathl::CMapParameter::RemoveAll ( )**

Remove all elements and clear the std::map

Referenced by brathl::CFileParams::Load().

## 6.7 Date conversion C APIs

### Functions

- LIBRATHL\_API int32\_t **brathl\_Cycle2YMDHMSM** (**brathl\_mission** mission, uint32\_t cycle, uint32\_t pass, **brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API int32\_t **brathl\_DayOfYear** (**brathl\_DateYMDHMSM** \*dateYMDHMSM, uint32\_t \*dayOfYear)
- LIBRATHL\_API int32\_t **brathl\_DiffDSM** (**brathl\_DateDSM** \*dateDSM1, **brathl\_DateDSM** \*dateDSM2, double \*diff)
- LIBRATHL\_API int32\_t **brathl\_DiffJulian** (**brathl\_DateJulian** \*dateJulian1, **brathl\_DateJulian** \*dateJulian2, double \*diff)
- LIBRATHL\_API int32\_t **brathl\_DiffYMDHMSM** (**brathl\_DateYMDHMSM** \*dateYMDHMSM1, **brathl\_DateYMDHMSM** \*dateYMDHMSM2, double \*diff)
- LIBRATHL\_API int32\_t **brathl\_DSM2Julian** (**brathl\_DateDSM** \*dateDSM, **brathl\_refDate** refDate, **brathl\_DateJulian** \*dateJulian)
- LIBRATHL\_API int32\_t **brathl\_DSM2Seconds** (**brathl\_DateDSM** \*dateDSM, **brathl\_refDate** refDate, **brathl\_DateSecond** \*dateSeconds)
- LIBRATHL\_API int32\_t **brathl\_DSM2YMDHMSM** (**brathl\_DateDSM** \*dateDSM, **brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API int32\_t **brathl\_Julian2DSM** (**brathl\_DateJulian** \*dateJulian, **brathl\_refDate** refDate, **brathl\_DateDSM** \*dateDSM)
- LIBRATHL\_API int32\_t **brathl\_Julian2Seconds** (**brathl\_DateJulian** \*dateJulian, **brathl\_refDate** refDate, **brathl\_DateSecond** \*dateSeconds)
- LIBRATHL\_API int32\_t **brathl\_Julian2YMDHMSM** (**brathl\_DateJulian** \*dateJulian, **brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API int32\_t **brathl\_NowYMDHMSM** (**brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API int32\_t **brathl\_Seconds2DSM** (**brathl\_DateSecond** \*dateSeconds, **brathl\_refDate** refDate, **brathl\_DateDSM** \*dateDSM)
- LIBRATHL\_API int32\_t **brathl\_Seconds2Julian** (**brathl\_DateSecond** \*dateSeconds, **brathl\_refDate** refDate, **brathl\_DateJulian** \*dateJulian)
- LIBRATHL\_API int32\_t **brathl\_Seconds2YMDHMSM** (**brathl\_DateSecond** \*dateSeconds, **brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API int32\_t **brathl\_YMDHMSM2Cycle** (**brathl\_mission** mission, **brathl\_DateYMDHMSM** \*dateYMDHMSM, uint32\_t \*cycle, uint32\_t \*pass)
- LIBRATHL\_API int32\_t **brathl\_YMDHMSM2DSM** (**brathl\_DateYMDHMSM** \*dateYMDHMSM, **brathl\_refDate** refDate, **brathl\_DateDSM** \*dateDSM)
- LIBRATHL\_API int32\_t **brathl\_YMDHMSM2Julian** (**brathl\_DateYMDHMSM** \*dateYMDHMSM, **brathl\_refDate** refDate, **brathl\_DateJulian** \*dateJulian)
- LIBRATHL\_API int32\_t **brathl\_YMDHMSM2Seconds** (**brathl\_DateYMDHMSM** \*dateYMDHMSM, **brathl\_refDate** refDate, **brathl\_DateSecond** \*dateSeconds)

### 6.7.1 Detailed Description

### 6.7.2 Function Documentation

#### 6.7.2.1 LIBRATHL\_API int32\_t brathl\_Cycle2YMDHMSM ( brathl\_mission mission, uint32\_t cycle, uint32\_t pass, brathl\_DateYMDHMSM \* dateYMDHMSM )

Converts a cyle/pass into a date

#### Parameters

in	<i>mission</i>	: mission type (see <b>brathl_mission</b> (p. 338))
in	<i>cycle</i>	: number of cycle to convert
in	<i>pass</i>	: number of pass in the cycle to convert
out	<i>dateYMDHMSM</i>	: date corresponding to the cycle/pass

**Returns**

#BRATHL\_SUCCESS or error code (see Cycle\_date\_error\_codes)

References brathl::CMission::Convert(), brathl::CDate::Convert2YMDHMSM(), and brathl::CMission::CtrlMission().

Referenced by FTN\_NAME().

### 6.7.2.2 LIBRATHL\_API int32\_t brathl\_DayOfYear ( brathl\_DateYMDHMSM \* dateYMDHMSM, uint32\_t \* dayOfYear )

Retrieves the day of year of a date

**Parameters**

in	<i>dateYMDHMSM</i>	: date
out	<i>dayOfYear</i>	: day of year of the date parameter

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::DayOfYear(), and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

### 6.7.2.3 LIBRATHL\_API int32\_t brathl\_DiffDSM ( brathl\_DateDSM \* dateDSM1, brathl\_DateDSM \* dateDSM2, double \* diff )

Computes the difference between two dates (date1 - date2) the result is expressed in a decimal number of seconds

**Parameters**

in	<i>dateDSM1</i>	: date1
in	<i>dateDSM2</i>	: date2
out	<i>diff</i>	: difference in seconds (date1 - date2)

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::SetDate().

Referenced by FTN\_NAME().

### 6.7.2.4 LIBRATHL\_API int32\_t brathl\_DiffJulian ( brathl\_DateJulian \* dateJulian1, brathl\_DateJulian \* dateJulian2, double \* diff )

Computes the difference between two dates (date1 - date2) the result is expressed in a decimal number of seconds

**Parameters**

in	<i>dateJulian1</i>	: date1
in	<i>dateJulian2</i>	: date2
out	<i>diff</i>	: difference in seconds (date1 - date2)

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.5** `LIBRATHL_API int32_t brathl_DiffYMDHMSM ( brathl_DateYMDHMSM * dateYMDHMSM1,  
brathl_DateYMDHMSM * dateYMDHMSM2, double * diff )`

Computes the difference between two dates (date1 - date2) the result is expressed in a decimal number of seconds

#### Parameters

in	<i>dateYMDHMS-M1</i>	: date1
in	<i>dateYMDHMS-M2</i>	: date2
out	<i>diff</i>	: difference in seconds (date1 - date2)

#### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.6** `LIBRATHL_API int32_t brathl_DSM2Julian ( brathl_DateDSM * dateDSM, brathl_refDate refDate,  
brathl_DateJulian * dateJulian )`

Converts a days-seconds-microseconds date into a decimal julian date, according to refDate parameter

#### Parameters

in	<i>dateDSM</i>	: date to convert
in	<i>refDate</i>	: date reference conversion
out	<i>dateJulian</i>	: result of the conversion

#### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2DecimalJulian(), \_structDateJulian::julian, \_structDateJulian::refDate, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.7** `LIBRATHL_API int32_t brathl_DSM2Seconds ( brathl_DateDSM * dateDSM, brathl_refDate refDate,  
brathl_DateSecond * dateSeconds )`

Converts a date in days-seconds-microseconds into a seconds, according to refDate parameter

#### Parameters

in	<i>dateDSM</i>	: date to convert
in	<i>refDate</i>	: date reference conversion
out	<i>dateSeconds</i>	: result of the conversion

#### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2Second(), \_structDateSecond::nbSeconds, \_structDateSecond::refDate, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.8** `LIBRATHL_API int32_t brathl_DSM2YMDHMSM ( brathl_DateDSM * dateDSM, brathl_DateYMDHMSM * dateYMDHMSM )`

Converts a days-seconds-microseconds date into a year, month, day, hour, minute, second, microsecond date

#### Parameters

in	<i>dateDSM</i>	: date to convert
out	<i>dateYMDHMSM</i>	: result of the conversion

#### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2YMDHMSM(), and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.9** `LIBRATHL_API int32_t brathl_Julian2DSM ( brathl_DateJulian * dateJulian, brathl_refDate refDate, brathl_DateDSM * dateDSM )`

Converts a decimal julian date into a days-seconds-microseconds date, according to refDate parameter

#### Parameters

in	<i>dateJulian</i>	: date to convert
in	<i>refDate</i>	: date reference conversion
out	<i>dateDSM</i>	: result of conversion

#### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2DSM(), \_structDateDSM::days, \_structDateDSM::muSeconds, \_structDateDSM::refDate, \_structDateDSM::seconds, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.10** `LIBRATHL_API int32_t brathl_Julian2Seconds ( brathl_DateJulian * dateJulian, brathl_refDate refDate, brathl_DateSecond * dateSeconds )`

Converts a decimal julian date into seconds, according to refDate parameter

#### Parameters

in	<i>dateJulian</i>	: date to convert
in	<i>refDate</i>	: date reference conversion
out	<i>dateSeconds</i>	: result of the conversion



## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2Second(), \_structDateSecond::nbSeconds, \_structDateSecond::refDate, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.11 LIBRATHL\_API int32\_t brathl\_Julian2YMDHMSM ( brathl\_DateJulian \* *dateJulian*, brathl\_DateYMDHMSM \* *dateYMDHMSM* )**

Converts a decimal julian date into a year, month, day, hour, minute, second, microsecond date

## Parameters

in	<i>dateJulian</i>	: date to convert
out	<i>dateYMDHMSM</i>	: result of the conversion

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2YMDHMSM(), and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.12 LIBRATHL\_API int32\_t brathl\_NowYMDHMSM ( brathl\_DateYMDHMSM \* *dateYMDHMSM* )**

Gets the current date/time,

## Parameters

out	<i>dateYMDHMSM</i>	: current date/time
-----	--------------------	---------------------

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2YMDHMSM(), and brathl::CDate::SetDateNow().

Referenced by FTN\_NAME().

**6.7.2.13 LIBRATHL\_API int32\_t brathl\_Seconds2DSM ( brathl\_DateSecond \* *dateSeconds*, brathl\_refDate *refDate*, brathl\_DateDSM \* *dateDSM* )**

Converts seconds into a days-seconds-microseconds date, according to refDate parameter

## Parameters

in	<i>dateSeconds</i>	: date to convert
in	<i>refDate</i>	: date reference conversion
out	<i>dateDSM</i>	: result of the conversion

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2DSM(), \_structDateDSM::days, \_structDateDSM::muSeconds, \_structDateDSM::refDate, \_structDateDSM::seconds, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.14** LIBRATHL\_API int32\_t brathl\_Seconds2Julian ( brathl\_DateSecond \* *dateSeconds*, brathl\_refDate *refDate*, brathl\_DateJulian \* *dateJulian* )

Converts seconds into a decimal julian date, according to refDate parameter

#### Parameters

in	<i>dateSeconds</i>	: date to convert
in	<i>refDate</i>	: date reference conversion
out	<i>dateJulian</i>	: result of the conversion

#### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2DecimalJulian(), \_structDateJulian::julian, \_structDateJulian::refDate, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.15** LIBRATHL\_API int32\_t brathl\_Seconds2YMDHMSM ( brathl\_DateSecond \* *dateSeconds*, brathl\_DateYMDHMSM \* *dateYMDHMSM* )

Converts seconds into a year, month, day, hour, minute, second, microsecond date

#### Parameters

in	<i>dateSeconds</i>	: date to convert
out	<i>dateYMDHMSM</i>	: result of the conversion

#### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2YMDHMSM(), and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.16** LIBRATHL\_API int32\_t brathl\_YMDHMSM2Cycle ( brathl\_mission *mission*, brathl\_DateYMDHMSM \* *dateYMDHMSM*, uint32\_t \* *cycle*, uint32\_t \* *pass* )

Converts a date into a cycle/pass

#### Parameters

in	<i>mission</i>	: mission type (see <b>brathl_mission</b> (p. 338))
in	<i>dateYMDHMSM</i>	: date to convert
out	<i>cycle</i>	: number of cycle
out	<i>pass</i>	: number of pass in the cycle

## Returns

#BRATHL\_SUCCESS or error code (see Cycle\_date\_error\_codes)

References brathl::CMission::Convert(), brathl::CMission::CtrlMission(), and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.17** LIBRATHL\_API int32\_t brathl\_YMDHMSM2DSM ( brathl\_DateYMDHMSM \* dateYMDHMSM, brathl\_refDate refDate, brathl\_DateDSM \* dateDSM )

Converts a year, month, day, hour, minute, second, microsecond date into a days-seconds-microseconds date, according to refDate parameter

## Parameters

in	dateYMDHMSM	: date to convert
in	refDate	: date reference conversion
out	dateDSM	: result of the conversion

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2DSM(), \_structDateDSM::days, \_structDateDSM::muSeconds, \_structDateDSM::refDate, \_structDateDSM::seconds, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.18** LIBRATHL\_API int32\_t brathl\_YMDHMSM2Julian ( brathl\_DateYMDHMSM \* dateYMDHMSM, brathl\_refDate refDate, brathl\_DateJulian \* dateJulian )

Converts a year, month, day, hour, minute, second, microsecond date into a decimal julian date, according to refDate parameter

## Parameters

in	dateYMDHMSM	: date to convert
in	refDate	: date reference conversion
out	dateJulian	: result of the conversion

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2DecimalJulian(), \_structDateJulian::julian, \_structDateJulian::refDate, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

**6.7.2.19** LIBRATHL\_API int32\_t brathl\_YMDHMSM2Seconds ( brathl\_DateYMDHMSM \* dateYMDHMSM, brathl\_refDate refDate, brathl\_DateSecond \* dateSeconds )

Converts a year, month, day, hour, minute, second, microsecond date into seconds, according to refDate parameter

## Parameters

in	dateYMDHMSM	: date to convert
in	refDate	: date reference conversion
out	dateSeconds	: result of the conversion

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl::CDate::Convert2Second(), \_structDateSecond::nbSeconds, \_structDateSecond::refDate, and brathl::CDate::SetDate().

Referenced by FTN\_NAME().

## 6.8 C API for reading data

### Functions

- LIBRATHL\_API void **brathl\_LoadAliasesDictionary** ()
- LIBRATHL\_API int32\_t **brathl\_ReadData** (int32\_t nbFiles, char \*\*fileNames, const char \*recordName, const char \*selection, int32\_t nbData, char \*\*dataExpressions, char \*\*units, double \*\*results, int32\_t sizes[], size\_t \*actualSize, int ignoreOutOfRange, int statistics, double defaultValue)
- LIBRATHL\_API void **brathl\_RegisterAlgorithms** ()

### 6.8.1 Detailed Description

### 6.8.2 Function Documentation

**6.8.2.1** LIBRATHL\_API int32\_t **brathl\_ReadData** ( int32\_t *nbFiles*, char \*\* *fileNames*, const char \* *recordName*, const char \* *selection*, int32\_t *nbData*, char \*\* *dataExpressions*, char \*\* *units*, double \*\* *results*, int32\_t *sizes*[], size\_t \* *actualSize*, int *ignoreOutOfRange*, int *statistics*, double *defaultValue* )

Read data from a set of files Each measure for a data is a scalar value (a single number)

### Parameters

in	<i>nbFiles</i>	: Number of files in file name list This is the usable size of #fileNames
in	<i>fileNames</i>	: File name list Must contain at least #nbFiles entries. If an entry is NULL or points to an empty string, the entry is ignored.
in	<i>selection</i>	: Expression involving data fields which has to be true to select returned data if NULL or empty string no selection is done (all data is selected)
in	<i>nbData</i>	: Number of expression used to retrieve data
in	<i>dataExpressions</i>	: Expression applied to data fields to build the wanted value Must contain at least #nbData entries. If an entry is NULL or points to an empty string, the data returned are always default values.
in	<i>units</i>	: Wanted unit for each expression Must be NULL or contain at least #nbData entries. If NULL, no unit conversion is done. If an entry is NULL or points to an empty string, no unit conversion is applied to the data of the corresponding expression. When a unit conversion has to be applied, the result of the expression is considered to be the base unit (SI). For example if the wanted unit is gram/l, the unit of the expression is supposed to be kilogram/m3 (internally all data are converted to base unit of the actual fields unit which is coherent with the above assumption).
	<i>results</i>	[in/out] : Data read Must be a vector of at least #nbData pointers (entries) to values to read. If NULL, nothing is returned in results and sizes MUST be NULL (otherwise this is an error). An entry can be NULL, see #sizes for the actual behaviour.
	<i>sizes</i>	[in/out] : Number of allocated values in a #results entry. Must be a vector of at least #nbData integers. If NULL, results MUST also be NULL (otherwise this is an error). If a value is 0, nothing is returned. If a value is > 0, the corresponding entry in results must not be NULL and must have been allocated to be able to store as much float values as indicated. If a value is < 0, and the corresponding entry in results is NULL, the entry will be allocated with enough space to store the result and sizes modified to reflect the size of allocated data (may be more than actual used ones). If a value is < 0, and the corresponding entry in results is not NULL, this is an error.
out	<i>actualSize</i>	: Number of actual data needed to store result. It cannot be NULL. The actual number of values in the corresponding entry of #results are returned in this number (all entries need the same amount of result). If #result is NULL, the number of values which would be needed for each entry is returned.

in	<i>ignoreOutOfRange</i>	: Skip excess data. 0=false, other = true If true, #actualSize can be greater than any positive value of #sizes, if there is too much value to store they are ignored. If false, it generates an error. Has no effect on #sizes entries which are <= 0 (or if it is NULL).
in	<i>statistics</i>	: returns statistics on data instead of data themselves 0=false, other = true If statistics is true, ignoreOutOfRange must be false. And sizes must be <=0 or >=5. The returned values for each expression are: <ul style="list-style-type: none"> <li>• <b>Count</b> of <i>valid</i> data taken into account. Invalid data are those which are equal to the default/missing value</li> <li>• <b>Mean</b> of the valid data.</li> <li>• <b>Standard deviation</b> of the valid data</li> <li>• <b>Minimum</b> value of the valid data</li> <li>• <b>Maximum</b> value of the valid data</li> </ul> In this case actualSize always returns 5
in	<i>defaultValue</i>	: value to use for default/missing values This is the value you want to indicate that a value is missing or invalid.

**Returns**

#BRATHL\_SUCCESS or error code

Referenced by FTN\_NAME().

## 6.9 Date conversion Fortran APIs

### Functions

- void **FTN\_NAME** (brathlf\_setrefuser1, BRATHLF\_SETREFUSER1)
- void **FTN\_NAME** (brathlf\_setrefuser2, BRATHLF\_SETREFUSER2)
- INTEGER4 **FTN\_NAME** (brathlf\_geterrno, BRATHLF\_GETERRNO)
- void **FTN\_NAME** (brathlf\_errno2string, BRATHLF\_ERRNO2STRING)
- INTEGER4 **FTN\_NAME** (brathlf\_seconds2dsm, BRATHLF\_SECONDS2DSM)
- INTEGER4 **FTN\_NAME** (brathlf\_dsm2seconds, BRATHLF\_DSM2SECONDS)
- INTEGER4 **FTN\_NAME** (brathlf\_julian2dsm, BRATHLF\_JULIAN2DSM)
- INTEGER4 **FTN\_NAME** (brathlf\_dsm2julian, BRATHLF\_DSM2JULIAN)
- INTEGER4 **FTN\_NAME** (brathlf\_ymdhmsm2dsm, BRATHLF\_YMDHMSM2DSM)
- INTEGER4 **FTN\_NAME** (brathlf\_dsm2ymdhmsm, BRATHLF\_DSM2YMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_seconds2julian, BRATHLF\_SECONDS2JULIAN)
- INTEGER4 **FTN\_NAME** (brathlf\_julian2seconds, BRATHLF\_JULIAN2SECONDS)
- INTEGER4 **FTN\_NAME** (brathlf\_seconds2ymdhmsm, BRATHLF\_SECONDS2YMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_ymdhmsm2seconds, BRATHLF\_YMDHMSM2SECONDS)
- INTEGER4 **FTN\_NAME** (brathlf\_julian2ymdhmsm, BRATHLF\_JULIAN2YMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_ymdhmsm2julian, BRATHLF\_YMDHMSM2JULIAN)
- INTEGER4 **FTN\_NAME** (brathlf\_nowymdhmsm, BRATHLF\_NOWYMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_dayofyear, BRATHLF\_DAYOFYEAR)
- INTEGER4 **FTN\_NAME** (brathlf\_diffymdhmsm, BRATHLF\_DIFFYMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_diffdsm, BRATHLF\_DIFFDSM)
- INTEGER4 **FTN\_NAME** (brathlf\_diffjulian, BRATHLF\_DIFFJULIAN)
- INTEGER4 **FTN\_NAME** (brathlf\_cycle2ymdhmsm, BRATHLF\_CYCLE2YMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_ymdhmsm2cycle, BRATHLF\_YMDHMSM2CYCLE)

### 6.9.1 Detailed Description

### 6.9.2 Function Documentation

#### 6.9.2.1 void FTN\_NAME ( brathlf\_setrefuser1 , BRATHLF\_SETREFUSER1 )

Initializes the date reference user1 from a string See also **brathl\_refDate** (p. 338)

#### Fortran specification

```
SUBROUTINE brathlf_SetRefUser1(dateRefUser)
  CHARACTER(*) dateRefUser
```

#### Parameters

in	<i>dateRefUser</i> : date string (format: YYYY-MM-DD HH:MN:SS:MS)
----	---

References BRATHL\_REF\_DATE\_USER\_LEN, and brathl\_refDateUser1.

#### 6.9.2.2 void FTN\_NAME ( brathlf\_setrefuser2 , BRATHLF\_SETREFUSER2 )

Initializes the date reference user2 from a string See also **brathl\_refDate** (p. 338)

#### Fortran specification

```
SUBROUTINE brathlf_SetRefUser2(dateRefUser)
  CHARACTER(*) dateRefUser
```

## Parameters

<i>dateRefUser</i>	: date string (format: YYYY-MM-DD HH:MM:SS:MS)
--------------------	--

References BRATHL\_REF\_DATE\_USER\_LEN, and brathl\_refDateUser2.

## 6.9.2.3 INTEGER4 FTN\_NAME ( brathlf\_geterrno , BRATHLF\_GETERRNO )

returns **brathl\_errno** (p. 342)

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_GetErrno()
```

## Returns

Last registered error code

## 6.9.2.4 void FTN\_NAME ( brathlf\_errno2string , BRATHLF\_ERRNO2STRING )

Retrieve a string with the error description

With a few exceptions almost all BRATHL functions return an integer that indicate whether the function was able to perform its operations successfully. The return value will be 0 on success and < 0 otherwise. The result is also save in the global variable #brat\_errno In case you get a negative value.

```
\par Fortran specification
SUBROUTINE brathlf_errno2string(err, str)<BR>
  INTEGER*4 err
  CHARACTER*(*) str
```

## Parameters

in	<i>err</i>	: error code
out	<i>str</i>	: string error description

## 6.9.2.5 INTEGER4 FTN\_NAME ( brathlf\_seconds2dsm , BRATHLF\_SECONDS2DSM )

Converts seconds into a days-seconds-microseconds date, according to refDate parameter

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_Seconds2DSM(iRefDateSrc,iSeconds,iRefDateDest,oDays,oSeconds,oMu-
Seconds)
INTEGER*4 iRefDateSrc REAL*8 iSeconds INTEGER*4 iRefDateDest INTEGER*4 oDays INTEGER*4 o-
Seconds INTEGER*4 oMuSeconds
```

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iSeconds</i>	: date to convert
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oDays</i>	: numbers of days
out	<i>oSeconds</i>	: number of seconds
out	<i>oMuSeconds</i>	: numbers of microseconds



## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_Seconds2DSM(), \_structDateDSM::days, \_structDateDSM::muSeconds, \_structDateSecond::nbSeconds, \_structDateSecond::refDate, and \_structDateDSM::seconds.

## 6.9.2.6 INTEGER4 FTN\_NAME ( brathlf\_dsm2seconds , BRATHLF\_DSM2SECONDS )

Converts a date in days-seconds-microseconds into a seconds, according to refDate parameter

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_DSM2Seconds(iRefDateSrc,iDays,iSeconds,iMuSeconds,iRefDateDest,o-
Seconds)
INTEGER*4 iRefDateSrc INTEGER*4 iDays INTEGER*4 iSeconds INTEGER*4 iMuSeconds INTEGER*4
iRefDateDest REAL*8 oSeconds
```

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iDays</i>	: numbers of days
in	<i>iSeconds</i>	: number of seconds
in	<i>iMuSeconds</i>	: numbers of microseconds
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oSeconds</i>	: date to convert

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_DSM2Seconds(), \_structDateDSM::days, \_structDateDSM::muSeconds, \_structDateSecond::nbSeconds, \_structDateDSM::refDate, and \_structDateDSM::seconds.

## 6.9.2.7 INTEGER4 FTN\_NAME ( brathlf\_julian2dsm , BRATHLF\_JULIAN2DSM )

Converts a decimal julian date into a days-seconds-microseconds date, according to refDate parameter

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_Julian2DSM(iRefDateSrc,iJulian,iRefDateDest,oDays,oSeconds,oMu-
Seconds)
INTEGER*4 iRefDateSrc REAL*8 iJulian INTEGER*4 iRefDateDest INTEGER*4 oDays INTEGER*4 o-
Seconds INTEGER*4 oMuSeconds
```

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iJulian</i>	: decimal julian date
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oDays</i>	: numbers of days
out	<i>oSeconds</i>	: number of seconds
out	<i>oMuSeconds</i>	: numbers of microseconds

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_Julian2DSM(), \_structDateDSM::days, \_structDateJulian::julian, \_structDateDSM::muSeconds, \_structDateJulian::refDate, and \_structDateDSM::seconds.

## 6.9.2.8 INTEGER4 FTN\_NAME ( brathlf\_dsm2julian , BRATHLF\_DSM2JULIAN )

Converts a days-seconds-microseconds date into a decimal julian date, according to refDate parameter

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_DSM2Julian(iRefDateSrc,iDays,iSeconds,iMuSeconds,iRefDateDest,oJulian)
INTEGER*4 iRefDateSrc INTEGER*4 iDays INTEGER*4 iSeconds INTEGER*4 iMuSeconds INTEGER*4
iRefDateDest REAL*8 oJulian
```

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iDays</i>	: numbers of days
in	<i>iSeconds</i>	: number of seconds
in	<i>iMuSeconds</i>	: numbers of microseconds
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oJulian</i>	: date to convert

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_DSM2Julian(), \_structDateDSM::days, \_structDateJulian::julian, \_structDateDSM::muSeconds, \_structDateDSM::refDate, and \_structDateDSM::seconds.

## 6.9.2.9 INTEGER4 FTN\_NAME ( brathlf\_ymdhmsm2dsm , BRATHLF\_YMDHMSM2DSM )

Converts a year, month, day, hour, minute, second, microsecond date into a days-seconds-microseconds date, according to refDate parameter

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_YMDHMSM2DSM(iYear,iMonth,iDay,iHour,iMinute,iSecond,iMuSecond,iRef-
DateDest,oDays,oSeconds,oMuSeconds)
```

```
INTEGER*4 iYear, INTEGER*4 iMonth, INTEGER*4 iDay, INTEGER*4 iHour, INTEGER*4 iMinute, INTEGER*4
iSecond, INTEGER*4 iMuSecond, INTEGER*4 iRefDateDest, INTEGER*4 oDays, INTEGER*4 oSeconds, INTE-
GER*4 oMuSeconds
```

## Parameters

in	<i>iYear</i>	: year
in	<i>iMonth</i>	: month
in	<i>iDay</i>	: day
in	<i>iHour</i>	: hour
in	<i>iMinute</i>	: minute
in	<i>iSecond</i>	: second
in	<i>iMuSecond</i>	: micro-second
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oDays</i>	: numbers of days
out	<i>oSeconds</i>	: number of seconds
out	<i>oMuSeconds</i>	: numbers of microseconds

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_YMDHMSM2DSM(), \_structDateDSM::days, \_structDateDSM::muSeconds, and \_structDateDSM::seconds.

## 6.9.2.10 INTEGER4 FTN\_NAME ( brathlf\_dsm2ymdhmsm , BRATHLF\_DSM2YMDHMSM )

Converts a days-seconds-microseconds date into a year, month, day, hour, minute, second, microsecond date according to refDate parameter

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_DSM2MDHMSM(iRefDateSrc,iDays,iSeconds,iMuSeconds,oYear,oMonth,oDay,oHour,oMinute,oSecond,oMuSecond)
```

INTEGER\*4 iRefDateSrc, INTEGER\*4 iDays, INTEGER\*4 iSeconds, INTEGER\*4 iMuSeconds INTEGER\*4 oYear, INTEGER\*4 oMonth, INTEGER\*4 oDay, INTEGER\*4 oHour, INTEGER\*4 oMinute, INTEGER\*4 oSecond, INTEGER\*4 oMuSecond,

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iDays</i>	: numbers of days
in	<i>iSeconds</i>	: number of seconds
in	<i>iMuSeconds</i>	: numbers of microseconds
out	<i>oYear</i>	: year
out	<i>oMonth</i>	: month
out	<i>oDay</i>	: day
out	<i>oHour</i>	: hour convert
out	<i>oMinute</i>	: minute to convert
out	<i>oSecond</i>	: second to convert
out	<i>oMuSecond</i>	: micro-second to convert

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_DSM2YMDHMSM(), \_structDateDSM::days, \_structDateDSM::muSeconds, \_structDateDSM::refDate, and \_structDateDSM::seconds.

## 6.9.2.11 INTEGER4 FTN\_NAME ( brathlf\_seconds2julian , BRATHLF\_SECONDS2JULIAN )

Converts seconds into a decimal julian date, according to refDate parameter INTEGER\*4 FUNCTION brathlf\_Seconds2Julian(iRefDateSrc,iSeconds,iRefDateDest,oJulian)

## Fortran specification

INTEGER\*4 iRefDateSrc, INTEGER\*4 iSeconds, INTEGER\*4 iRefDateDest REAL\*8 oJulian,

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iSeconds</i>	: number of seconds
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oJulian</i>	: julian date

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_Seconds2Julian(), \_structDateJulian::julian, \_structDateSecond::nbSeconds, and \_structDateSecond::refDate.

## 6.9.2.12 INTEGER4 FTN.NAME ( brathlf\_julian2seconds , BRATHLF\_JULIAN2SECONDS )

Converts a decimal julian date into seconds, according to refDate parameter INTEGER\*4 FUNCTION brathlf\_Seconds2Julian(iRefDateSrc,iJulian,iRefDateDest,oSeconds)

## Fortran specification

INTEGER\*4 iRefDateSrc, REAL\*8 iJulian, INTEGER\*4 iRefDateDest INTEGER\*4 oSeconds,

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iJulian</i>	: julian date
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oSeconds</i>	: number of seconds

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_Julian2Seconds(), \_structDateJulian::julian, \_structDateSecond::nbSeconds, and \_structDateJulian::refDate.

## 6.9.2.13 INTEGER4 FTN.NAME ( brathlf\_seconds2ymdhmsm , BRATHLF\_SECONDS2YMDHMSM )

Converts seconds into into a year, month, day, hour, minute, second, microsecond date, according to refDate parameter INTEGER\*4 FUNCTION brathlf\_Seconds2YMDHMSM(iRefDateSrc,iSeconds,oYear,oMonth,oDay,oHour,oMinute,oSecond,oMuSecond)

## Fortran specification

INTEGER\*4 iRefDateSrc, INTEGER\*4 iSeconds, INTEGER\*4 iRefDateDest INTEGER\*4 oYear, INTEGER\*4 oMonth, INTEGER\*4 oDay, INTEGER\*4 oHour, INTEGER\*4 oMinute, INTEGER\*4 oSecond, INTEGER\*4 oMuSecond,

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iSeconds</i>	: number of seconds
out	<i>oYear</i>	: year
out	<i>oMonth</i>	: month
out	<i>oDay</i>	: day
out	<i>oHour</i>	: hour convert
out	<i>oMinute</i>	: minute to convert
out	<i>oSecond</i>	: second to convert
out	<i>oMuSecond</i>	: micro-second to convert

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_Seconds2YMDHMSM(), \_structDateSecond::nbSeconds, and \_structDateSecond::refDate.

#### 6.9.2.14 INTEGER4 FTN.NAME ( brathlf\_ymdhmsm2seconds , BRATHLF\_YMDHMSM2SECONDS )

Converts a year, month, day, hour, minute, second, microsecond date into seconds, according to refDate parameter

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_YMDHMSM2DSM(iYear,iMonth,iDay,iHour,iMinute,iSecond,iMuSecond,iRefDateDest,oSeconds)
```

INTEGER\*4 iYear, INTEGER\*4 iMonth, INTEGER\*4 iDay, INTEGER\*4 iHour, INTEGER\*4 iMinute, INTEGER\*4 iSecond, INTEGER\*4 iMuSecond, INTEGER\*4 iRefDateDest, INTEGER\*4 oSeconds,

## Parameters

in	<i>iYear</i>	: year
in	<i>iMonth</i>	: month
in	<i>iDay</i>	: day
in	<i>iHour</i>	: hour
in	<i>iMinute</i>	: minute
in	<i>iSecond</i>	: second
in	<i>iMuSecond</i>	: micro-second
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oSeconds</i>	: number of seconds

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_YMDHMSM2Seconds(), and \_structDateSecond::nbSeconds.

#### 6.9.2.15 INTEGER4 FTN.NAME ( brathlf\_julian2ymdhmsm , BRATHLF\_JULIAN2YMDHMSM )

Converts julian date into into a year, month, day, hour, minute, second, microsecond date, according to refDate parameter  
 INTEGER\*4 FUNCTION brathl\_Julian2YMDHMSM(iRefDateSrc,iJulian,oYear,oMonth,oDay,oHour,oMinute,oSecond,oMuSecond)

## Fortran specification

INTEGER\*4 iRefDateSrc, REAL\*8 iJulian, INTEGER\*4 oYear, INTEGER\*4 oMonth, INTEGER\*4 oDay, INTEGER\*4 oHour, INTEGER\*4 oMinute, INTEGER\*4 oSecond, INTEGER\*4 oMuSecond,

## Parameters

in	<i>iRefDateSrc</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iJulian</i>	: julian date
out	<i>oYear</i>	: year
out	<i>oMonth</i>	: month
out	<i>oDay</i>	: day
out	<i>oHour</i>	: hour convert
out	<i>oMinute</i>	: minute to convert
out	<i>oSecond</i>	: second to convert
out	<i>oMuSecond</i>	: micro-second to convert

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_Julian2YMDHMSM(), \_structDateJulian::julian, and \_structDateJulian::refDate.

**6.9.2.16 INTEGER4 FTN\_NAME ( brathlf\_ymdhmsm2julian , BRATHLF\_YMDHMSM2JULIAN )**

Converts a year, month, day, hour, minute, second, microsecond date into a decimal julian date, according to refDate parameter

**Fortran specification**

```
INTEGER*4 FUNCTION brathlf_YMDHMSM2Julian(iYear,iMonth,iDay,iHour,iMinute,iSecond,iMuSecond,iRefDateDest,oJulian)
```

INTEGER\*4 iYear, INTEGER\*4 iMonth, INTEGER\*4 iDay, INTEGER\*4 iHour, INTEGER\*4 iMinute, INTEGER\*4 iSecond, INTEGER\*4 iMuSecond, INTEGER\*4 iRefDateDest, REAL\*8 oJulian,

**Parameters**

in	<i>iYear</i>	: year
in	<i>iMonth</i>	: month
in	<i>iDay</i>	: day
in	<i>iHour</i>	: hour
in	<i>iMinute</i>	: minute
in	<i>iSecond</i>	: second
in	<i>iMuSecond</i>	: micro-second
in	<i>iRefDateDest</i>	: date reference conversion (see <b>brathl_refDate</b> (p. 338))
out	<i>oJulian</i>	: julian date

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_YMDHMSM2Julian(), and \_structDateJulian::julian.

**6.9.2.17 INTEGER4 FTN\_NAME ( brathlf\_nowymdhmsm , BRATHLF\_NOWYMDHMSM )**

Gets the current date/time,

**Fortran specification**

```
INTEGER*4 FUNCTION brathlf_NowYMDHMSM(oYear,oMonth,oDay,oHour,oMinute,oSecond,oMuSecond)
```

INTEGER\*4 oYear, INTEGER\*4 oMonth, INTEGER\*4 oDay, INTEGER\*4 oHour, INTEGER\*4 oMinute, INTEGER\*4 oSecond, INTEGER\*4 oMuSecond,

**Parameters**

out	<i>oYear</i>	: year
out	<i>oMonth</i>	: month
out	<i>oDay</i>	: day
out	<i>oHour</i>	: hour convert
out	<i>oMinute</i>	: minute to convert
out	<i>oSecond</i>	: second to convert
out	<i>oMuSecond</i>	: micro-second to convert

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_NowYMDHMSM().

### 6.9.2.18 INTEGER4 FTN\_NAME ( brathlf\_dayofyear , BRATHLF\_DAYOFYEAR )

Retrieves the day of year of a date

## Fortran specification

```
INTEGER*4 FUNCTION brathlf_DayOfYear(iYear,iMonth,iDay,iHour,iMinute,iSecond,iMuSecond,iRefDate-
Dest,oSeconds)
```

INTEGER\*4 iYear, INTEGER\*4 iMonth, INTEGER\*4 iDay, INTEGER\*4 iHour, INTEGER\*4 iMinute, INTEGER\*4 iSecond, INTEGER\*4 iMuSecond, INTEGER\*4 oQuant,

## Parameters

in	<i>iYear</i>	: year
in	<i>iMonth</i>	: month
in	<i>iDay</i>	: day
in	<i>iHour</i>	: hour
in	<i>iMinute</i>	: minute
in	<i>iSecond</i>	: second
in	<i>iMuSecond</i>	: micro-second
out	<i>oQuant</i>	: day of year

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_DayOfYear().

### 6.9.2.19 INTEGER4 FTN\_NAME ( brathlf\_diffymdhmsm , BRATHLF\_DIFFYMDHMSM )

Computes the difference between two dates (date1 - date2). The result is expressed in a decimal number of seconds

## Fortran specification

```
INTEGER*4 FUNCTION brathl_DiffYMDHMSM(iYear1,iMonth1,iDay1,iHour1,iMinute1,iSecond1,iMu-
Second1,iYear2,iMonth2,iDay2,iHour2,iMinute2,iSecond2,iMuSecond2)
```

INTEGER\*4 iYear1, INTEGER\*4 iMonth1, INTEGER\*4 iDay1, INTEGER\*4 iHour1, INTEGER\*4 iMinute1, INTEGER\*4 iSecond1, INTEGER\*4 iMuSecond1, INTEGER\*4 iYear2, INTEGER\*4 iMonth2, INTEGER\*4 iDay2, INTEGER\*4 iHour2, INTEGER\*4 iMinute2, INTEGER\*4 iSecond2, INTEGER\*4 iMuSecond2, REAL\*8 diff

## Parameters

in	<i>iYear1</i>	: year
in	<i>iMonth1</i>	: month
in	<i>iDay1</i>	: day
in	<i>iHour1</i>	: hour
in	<i>iMinute1</i>	: minute
in	<i>iSecond1</i>	: second
in	<i>iMuSecond1</i>	: micro-second
in	<i>iYear2</i>	: year
in	<i>iMonth2</i>	: month
in	<i>iDay2</i>	: day

in	<i>iHour2</i>	: hour
in	<i>iMinute2</i>	: minute
in	<i>iSecond2</i>	: second
in	<i>iMuSecond2</i>	: micro-second
out	<i>diff</i>	: difference in seconds (date1 - date2)

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_DiffYMDHMSM().

**6.9.2.20 INTEGER4 FTN.NAME ( brathlf\_diffdsm , BRATHLF\_DIFFDSM )**

Computes the difference between two dates (date1 - date2). The result is expressed in a decimal number of seconds

**Fortran specification**

```
INTEGER*4 FUNCTION brathl_DiffDSM(iRefDate1,iDays1,iSeconds1,iMuSeconds1,iRefDate2,iDays2,iSeconds2,iMuSeconds2,diff)
```

INTEGER\*4 iRefDate1, INTEGER\*4 iDays1, INTEGER\*4 iSeconds1, INTEGER\*4 iMuSeconds1, INTEGER\*4 iRefDate2, INTEGER\*4 iDays2, INTEGER\*4 iSeconds2, INTEGER\*4 iMuSeconds2 REAL\*8 diff

**Parameters**

in	<i>iRefDate1</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iDays1</i>	: numbers of days
in	<i>iSeconds1</i>	: number of seconds
in	<i>iMuSeconds1</i>	: numbers of microseconds
in	<i>iRefDate2</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iDays2</i>	: numbers of days
in	<i>iSeconds2</i>	: number of seconds
in	<i>iMuSeconds2</i>	: numbers of microseconds
out	<i>diff</i>	: difference in seconds (date1 - date2)

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_DiffDSM(), \_structDateDSM::days, \_structDateDSM::muSeconds, \_structDateDSM::refDate, and \_structDateDSM::seconds.

**6.9.2.21 INTEGER4 FTN.NAME ( brathlf\_diffjulian , BRATHLF\_DIFFJULIAN )**

Computes the difference between two dates (date1 - date2). The result is expressed in a decimal number of seconds

**Fortran specification**

```
INTEGER*4 FUNCTION brathl_DiffJulian(iRefDate1,iJulian1,iRefDate2,iJulian2,diff)
```

INTEGER\*4 iRefDate1, REAL\*8 iJulian1, INTEGER\*4 iRefDate2, REAL\*8 iJulian2, REAL\*8 diff

**Parameters**

in	<i>iRefDate1</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iJulian1</i>	: julian date
in	<i>iRefDate2</i>	: source date reference (see <b>brathl_refDate</b> (p. 338))
in	<i>iJulian2</i>	: julian date
out	<i>diff</i>	: difference in seconds (date1 - date2)



## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_DiffJulian(), \_structDateJulian::julian, and \_structDateJulian::refDate.

## 6.9.2.22 INTEGER4 FTN.NAME ( brathlf\_cycle2ymdhmsm , BRATHLF\_CYCLE2YMDHMSM )

Converts a cyle/pass into a date

## Fortran specification

```
INTEGER*4 FUNCTION brathl_Cycle2YMDHMSM(iMission,iCycle,iPass,oYear,oMonth,oDay,oHour,oMinute,oSecond,oMuSecond)
```

INTEGER\*4 iMission, INTEGER\*4 iCycle, INTEGER\*4 iPass, INTEGER\*4 oYear, INTEGER\*4 oMonth, INTEGER\*4 oDay, INTEGER\*4 oHour, INTEGER\*4 oMinute, INTEGER\*4 oSecond, INTEGER\*4 oMuSecond,

## Parameters

in	<i>iMission</i>	: mission type (see <b>brathl_mission</b> (p. 338))
in	<i>iCycle</i>	: number of cycle to convert
in	<i>iPass</i>	: number of pass in the cycle to convert
out	<i>oYear</i>	: year
out	<i>oMonth</i>	: month
out	<i>oDay</i>	: day
out	<i>oHour</i>	: hour
out	<i>oMinute</i>	: minute
out	<i>oSecond</i>	: second
out	<i>oMuSecond</i>	: micro-second

## Returns

#BRATHL\_SUCCESS or error code (see Cycle\_date\_error\_codes)

References brathl\_Cycle2YMDHMSM().

## 6.9.2.23 INTEGER4 FTN.NAME ( brathlf\_ymdhmsm2cycle , BRATHLF\_YMDHMSM2CYCLE )

Converts a date into a cycle/pass

## Fortran specification

```
INTEGER*4 FUNCTION brathl_YMDHMSM2Cycle(iMission,iYear,iMonth,iDay,iHour,iMinute,iSecond,iMuSecond,oCycle,oPass)
```

INTEGER\*4 iMission, INTEGER\*4 iYear, INTEGER\*4 iMonth, INTEGER\*4 iDay, INTEGER\*4 iHour, INTEGER\*4 iMinute, INTEGER\*4 iSecond, INTEGER\*4 iMuSecond, INTEGER\*4 oCycle, INTEGER\*4 oPass,

## Parameters

in	<i>iMission</i>	: mission type (see <b>brathl_mission</b> (p. 338))
in	<i>iYear</i>	: year
in	<i>iMonth</i>	: month
in	<i>iDay</i>	: day
in	<i>iHour</i>	: hour
in	<i>iMinute</i>	: minute
in	<i>iSecond</i>	: second
in	<i>iMuSecond</i>	: micro-second
out	<i>oCycle</i>	: number of cycle to convert
out	<i>oPass</i>	: number of pass in the cycle to convert

**Returns**

#BRATHL\_SUCCESS or error code (see Cycle\_date\_error\_codes)

References brathl\_YMDHMSM2Cycle().

## 6.10 Fortran API for reading data

### Functions

- INTEGER4 **FTN\_NAME** (brathlf\_readdata, BRATHLF\_READDATA)

#### 6.10.1 Detailed Description

#### 6.10.2 Function Documentation

##### 6.10.2.1 INTEGER4 FTN\_NAME ( brathlf\_readdata , BRATHLF\_READDATA )

Read data from a set of files Each measure for a data is a scalar value (a single number)

#### Fortran specification

```

INTEGER*4 FUNCTION brathlf_ReadData(nbFiles,
$ fileNames,
$ recordName,
$ selection,
$ nbData,
$ dataExpressions,
$ units,
$ results,
$ size,
$ actualSize,
$ ignoreOutOfRange,
$ statistics,
$ defaultValue,
INTEGER*4 nbFiles
CHARACTER*(*) fileNames(nbFiles) CHARACTER*(*) recordName CHARACTER*(*) selection INTEGER*4
nbData CHARACTER*(*) dataExpressions(nbData) CHARACTER*(*) units(nbData) REAL*8 results(size,nb-
Data) INTEGER*4 size INTEGER*4 actualSize INTEGER*4 ignoreOutOfRange INTEGER*4 statistics REA-
L*8 defaultValue

```

#### Parameters

in	<i>nbFiles</i>	: Number of files in file name list This is the usable size of #fileNames
in	<i>fileNames</i>	: File name list Must contain at least #nbFiles entries. If an entry is an empty string, the entry is ignored.
in	<i>selection</i>	: Expression involving data fields which has to be true to select returned data if it is an empty string no selection is done (all data is selected)
in	<i>nbData</i>	: Number of expressions used to retrieve data
in	<i>dataExpressions</i>	: Expression applied to data fields to build the wanted value Must contain at least #nbData entries. If an entry is an empty string, the data returned are always default values.
in	<i>units</i>	: Wanted unit for each expression Must contain at least #nbData entries. If an entry is an empty string, no unit conversion is applied to the data of the corresponding expression. When a unit conversion has to be applied, the result of the expression is considered to be the base unit (SI). For example if the wanted unit is gram/l, the unit of the expression is supposed to be kilogram/m3 (internaly all data are converted to base unit of the actual fields unit which is coherent with the above assumption).
out	<i>results</i>	: Data read Must be a matrix of at least #nbData entries of size values. Must be declared as real*8 results[size, N] where N >= #nbData
in	<i>size</i>	: Number of data in each #results entry. Must be >=0. If 0, nothing is returned in results and results can be anything.

out	<i>actualSize</i>	: Number of actual data needed to store result. The actual number of values in the corresponding entry of #results are returned in this number. If size is 0 this is the number of values that would have been returned.
in	<i>ignoreOutOfRange</i>	: Skip excess data. 0=false, other = true. If true, #actualSize can be greater than any positive value of #sizes, if there is too much value to store they are ignored. If false, it generates an error.
in	<i>statistics</i>	: returns statistics on data instead of data themselves. 0=false, other = true. If statistics is true, ignoreOutOfRange must be false. And sizes must be ≤0 or ≥5. The returned values for each expression are: <ul style="list-style-type: none"> <li>• <b>Count</b> of <i>valid</i> data taken into account. Invalid data are those which are equal to the default/missing value</li> <li>• <b>Mean</b> of the valid data.</li> <li>• <b>Standard deviation</b> of the valid data</li> <li>• <b>Minimum</b> value of the valid data</li> <li>• <b>Maximum</b> value of the valid data</li> </ul> In this case actualSize always returns 5
in	<i>defaultValue</i>	: value to use for default/missing values. This is the value you want to indicate that a value is missing or invalid.

#### Returns

#BRATHL\_SUCCESS or error code

References `brathl_ReadData()`.

## 7 Namespace Documentation

### 7.1 bratI Namespace Reference

#### Classes

- class **CBratAlgoFilterGaussian1D**
- class **CBratAlgoFilterGaussian2D**
- class **CBratAlgoFilterLanczos1D**
- class **CBratAlgoFilterLanczos2D**
- class **CBratAlgoFilterLoess1D**
- class **CBratAlgoFilterLoess2D**
- class **CBratAlgoFilterMedian1D**
- class **CBratAlgoFilterMedian2D**
- class **CBratAlgorithmBase**
- class **CBratAlgorithmGeosVel**
- class **CBratAlgorithmGeosVelAtp**
- class **CBratAlgorithmGeosVelGrid**
- class **CBratAlgorithmGeosVelGridU**
- class **CBratAlgorithmGeosVelGridV**
- class **CCriteria**
- class **CCriteriaCycle**
- class **CCriteriaCycleInfo**
- class **CCriteriaDatetime**
- class **CCriteriaDatetimeInfo**
- class **CCriterialInfo**
- class **CCriteriaLatLon**
- class **CCriteriaLatLonInfo**
- class **CCriteriaPass**
- class **CCriteriaPassInfo**
- class **CCriteriaPassInt**
- class **CCriteriaPassIntInfo**
- class **CCriteriaPassString**
- class **CCriteriaPassStringInfo**
- class **CDataSet**
- class **CDate**
- class **CDatePeriod**
- class **CDoubleMap**
- class **CDoublePtrArray**
- class **CDoublePtrDoubleMap**
- class **CExpressionValue**
- class **CExternalFilesAvisoGrid**
- class **CExternalFilesJason2**
- class **CExternalFilesNetCDF**
- class **CField**
- class **CFieldArray**
- class **CFieldBasic**
- class **CFieldIndexData**
- class **CFieldNetCdf**
- class **CFieldNetCdfCF**
- class **CFieldNetCdfCFAttr**
- class **CFieldRecord**
- class **CFieldSet**
- class **CFieldSetArrayDbI**

- class **CFieldSetDbI**
- class **CFieldSetString**
- class **CFile**
- class **CFileParams**
- class **CInternalFiles**
- class **CInternalFilesYFX**
- class **CInternalFilesZFX**
- class **CIntList**
- class **CIntMap**
- class **CMapParameter**
- class **CMapProduct**
- class **CMission**
- class **CObArray**
- class **CObDoubleMap**
- class **CObIntMap**
- class **CObList**
- class **CObMap**
- class **CObStack**
- class **CParameter**
- class **CProductAop**
- class **CProductCryosat**
- class **CProductEnvisat**
- class **CProductErs**
- class **CProductErsWAP**
- class **CProductGfo**
- class **CProductJason**
- class **CProductJason2**
- class **CProductList**
- class **CProductNetCdf**
- class **CProductNetCdfCF**
- class **CProductPodaac**
- class **CProductRads**
- class **CProductReaper**
- class **CProductRiverLake**
- class **CProductTopex**
- class **CProductTopexSDR**
- class **CPtrMap**
- class **CRecord**
- class **CRecordSet**
- class **CRegisteredPass**
- class **CStringList**
- class **CStringMap**
- class **CTools**
- class **CTreeField**
- class **CUIntMap**

## Typedefs

- typedef std::vector< **doublearray** > **arraydoublearray**
- typedef std::vector< **doubleptrarray** > **arraydoubleptrarray**
- typedef std::bitset< 32 > **bitSet32**
- typedef std::vector< double > **doublearray**
- typedef double \* **DoublePtr**
- typedef std::vector< DoublePtr > **doubleptrarray**
- typedef double **ExpressionCallableFunction1** (double)
- typedef double **ExpressionCallableFunction2** (double, double)
- typedef double **ExpressionCallableFunction3** (double, double, double)
- typedef double **ExpressionCallableFunctionAlgoN** (const char \*, CVectorBratAlgorithmParam &arg)
- typedef double **ExpressionCallableFunctionBratAlgoBaseN** (CBratAlgorithmBase \*algo, CVectorBratAlgorithmParam &arg)
- typedef double **ExpressionCallableFunctionStrToFIt1** (const char \*)
- typedef const char \* **ExpressionCallableFunctionStrToStr1** (const char \*)
- typedef CUIntArray **ExpressionValueDimensions**
- typedef CDoubleArray **ExpressionValueValues**
- typedef std::list< int32\_t > **intlist**
- typedef std::map< std::string, CParameter \* > **map\_parameter**
- typedef std::map< std::string, CStringArray > **maparraystring**
- typedef std::map< std::string, CBratAlgorithmBase \* > **mapbratalgorithmbase**
- typedef std::map< std::string, double > **mapdouble**
- typedef std::map< double, DoublePtr \* > **mapdoubledoubleptr**
- typedef std::map< double, CBratObject \* > **mapdoubleobject**
- typedef std::map< std::string, int32\_t > **mapint**
- typedef std::map< int32\_t, CBratObject \* > **mapintobject**
- typedef std::map< std::string, CBratObject \* > **mapobject**
- typedef std::map< std::string, void \* > **mapptr**
- typedef std::map< std::string, std::string > **mapstring**
- typedef std::map< std::string, CObjectTreeNode \* > **mapTreeNode**
- typedef std::map< std::string, uint32\_t > **mapuint**
- typedef std::numeric\_limits< char > **numeric\_limits\_char**
- typedef std::vector< CBratObject \* > **obarray**
- typedef std::list< CBratObject \* > **oblist**
- typedef std::stack< CBratObject \* > **obstack**
- typedef std::vector< std::string > **stringarray**
- typedef std::list< std::string > **stringlist**
- typedef std::vector< CBratAlgorithmBase \* > **vectorbratalgorithmbase**

## Enumerations

- enum **ExpressionValueType** { **CharacterType**, **FloatType** }
- enum **FunctionCategory** { **MathTrigo**, **Statistical**, **Logical**, **Relational**, **Constant**, **BitwiseOp**, **DateTime**, **Algorithm**, **Geographical** }
- enum **NetCDFVarKind** { **Unknown**, **X**, **Y**, **Z**, **T**, **Latitude**, **Longitude**, **Data** }

## Functions

- template<class T >  
**CBratAlgorithmBase** \* **base\_factory** ()
- CExternalFiles \* **BuildExistingExternalFileKind** (const std::string &Name)
- CInternalFiles \* **BuildExistingInternalFileKind** (const std::string &name, const CStringArray \*fieldNames)
- static void **CommentHnd** (void \*userData, const char \*data)
- static void **DefaultHnd** (void \*userData, const char \*s, int len)
- static void **EndElementHnd** (void \*userData, const char \*name)
- static void **StartCdataHnd** (void \*userData)
- static void **StartElementHnd** (void \*userData, const char \*name, const char \*\*atts)
- static void **TextHnd** (void \*userData, const char \*s, int len)

## Variables

- static const DefCharFunction1 **CharFonctions1** []
- static const DefConstant **Constants** []
- const std::string **CRYOSAT\_MPH** = "mph"
- const std::string **CRYOSAT\_SPH** = "sph"
- const long **DEFAULT\_DIM** [] = {1}
- const char \* **DUMP\_FORMAT\_DOUBLE** = "%.15g"
- const std::string **ENVISAT\_MPH** = "mph"
- const std::string **ENVISAT\_SPH** = "sph"
- const std::string **ERS\_HEADER** = "header"
- static const DefFunction1 **Fonctions1** []
- static const DefFunction2 **Fonctions2** []
- static const DefFunction3 **Fonctions3** []
- static const DefFunctionAlgoN **FonctionsAlgoN** []
- static const  
DefFunctionBratAlgoBaseN **FonctionsBratAlgoBaseN** []
- const std::string **FORMAT\_FLOAT\_LATLON** = "%-#.5g"
- const std::string **FORMAT\_INT\_CYCLE** = "%d"
- const std::string **FORMAT\_INT\_PASS** = "%d"
- const std::string **GDR** = "GDR"
- const std::string **GDR\_TITLE** = "standard dataset"
- const std::string **GENERIC\_NETCDF\_TYPE** = "Generic NetCdf"
- const std::string **GFO\_HEADER** = "header"
- const std::string **JASON\_HEADER** = "header"
- const int32\_t **MAX\_NUM\_DIMS** = CODA\_MAX\_NUM\_DIMS
- const std::string **NC\_BYTE\_NAME** = "signed 1 byte integer"
- const std::string **NC\_CHAR\_NAME** = "ASCII character"
- const std::string **NC\_DOUBLE\_NAME** = "double precision floating point number"
- const std::string **NC\_FLOAT\_NAME** = "single precision floating point number"



- const std::string **NC\_INT64\_NAME** = "signed 8 byte integer"
- const std::string **NC\_INT\_NAME** = "signed 4 byte integer"
- const std::string **NC\_NAT\_NAME** = "Not A Type"
- const std::string **NC\_SHORT\_NAME** = "signed 2 byte integer"
- const std::string **NC\_STRING\_NAME** = "array of strings"
- const std::string **NC\_UBYTE\_NAME** = "unsigned 1 byte integer"
- const std::string **NC\_UINT64\_NAME** = "unsigned 8 byte integer"
- const std::string **NC\_UINT\_NAME** = "unsigned 4 byte integer"
- const std::string **NC\_USHORT\_NAME** = "unsigned 2 byte integer"
- static const double **NcFillByte** = NC\_FILL\_BYTE
- static const double **NcFillChar** = NC\_FILL\_CHAR
- static const double **NcFillDouble** = NC\_FILL\_DOUBLE
- static const double **NcFillFloat** = NC\_FILL\_FLOAT
- static const double **NcFillInt** = NC\_FILL\_INT
- static const double **NcFillInt64** = (double)NC\_FILL\_INT64
- static const double **NcFillShort** = NC\_FILL\_SHORT
- static const double **NcFillString** = (double)(ptrdiff\_t)NC\_FILL\_STRING
- static const double **NcFillUByte** = NC\_FILL\_UBYTE
- static const double **NcFillUInt** = NC\_FILL\_UINT
- static const double **NcFillUInt64** = (double)NC\_FILL\_UINT64
- static const double **NcFillUShort** = NC\_FILL\_USHORT
- const std::string **NETCDF\_CF\_PRODUCT\_CLASS** = "NETCDF\_CF"
- const std::string **NETCDF\_PRODUCT\_CLASS** = "NETCDF"
- const std::string **PODAAC\_HEADER** = "header"
- const std::string **SGDR** = "SGDR"
- const std::string **SGDR\_TITLE** = "expertise dataset"
- const std::string **SSHA** = "SSHA"
- const std::string **SSHA\_TITLE** = "reduced dataset"
- const std::string **UNKNOWN\_PRODUCT\_CLASS** = "UNKNOWN"
- const std::string **YFX\_NETCDF\_TYPE** = "Y=F(X)"
- const std::string **ZFX\_Y\_NETCDF\_TYPE** = "Z=F(X,Y)"

### 7.1.1 Detailed Description

object base class

Version

1.0

### 7.1.2 Typedef Documentation

#### 7.1.2.1 typedef std::vector<DoublePtr> brathl::doubleptrarray

Creates a type name for double pointer array

#### 7.1.2.2 typedef std::list<int32\_t> brathl::intlist

Creates a type name for int std::list

#### 7.1.2.3 typedef std::map<std::string, CParameter\*> brathl::map\_parameter

Creates a type name for std::map parameter base class

#### 7.1.2.4 typedef std::map<std::string, double> brathl::mapdouble

Creates a type name for std::map pointer base class

**7.1.2.5 typedef std::map<double, DoublePtr\*> brathl::mapdoubledoubleptr**

Creates a type name for std::map pointer base class

**7.1.2.6 typedef std::map<double, CBratObject\*> brathl::mapdoubleobject**

Creates a type name for std::map object base class

**7.1.2.7 typedef std::map<std::string, int32\_t> brathl::mapint**

Creates a type name for std::map int base class

**7.1.2.8 typedef std::map<int32\_t, CBratObject\*> brathl::mapintobject**

Creates a type name for std::map object base class

**7.1.2.9 typedef std::map<std::string, CBratObject\*> brathl::mapobject**

Creates a type name for std::map object base class

**7.1.2.10 typedef std::map<std::string, void\*> brathl::mapptr**

Creates a type name for std::map pointer base class

**7.1.2.11 typedef std::map<std::string, std::string> brathl::mapstring**

Creates a type name for std::map object base class

**7.1.2.12 typedef std::map<std::string, uint32\_t> brathl::mapuint**

Creates a type name for std::map unsigned int base class

**7.1.2.13 typedef std::vector<CBratObject\*> brathl::obarray**

Creates a type name for object array

**7.1.2.14 typedef std::list<CBratObject\*> brathl::oblist**

Creates a type name for object std::list

**7.1.2.15 typedef std::stack<CBratObject\*> brathl::obstack**

Creates a type name for object std::stack

**7.1.2.16 typedef std::vector<std::string> brathl::stringarray**

Creates a type name for std::string array

**7.1.2.17 typedef std::list<std::string> brathl::stringlist**

Creates a type name for std::string std::list

**7.1.3 Variable Documentation****7.1.3.1 const DefCharFunction1 brathl::CharFonctions1[] [static]**

**Initial value:**

```
{
    DefCharFunction1("to_date",      "Translates a std::string value into a
    date value"                      "\nAllowed format are:"
```

```

std::string."
                                "\n\n YYYY-MM-DD HH:MM:SS.MS
                                "\n For instance:"
                                "\n '1995-12-05 12:02:10.1230'"
                                "\n '1995-12-05 12:02:10'"
                                "\n '1995-12-05'"
                                "\n\n a julian std::string:
format:positive 'Days Seconds Microseconds'"
                                "\n Seconds must be strictly less 86400
and Microseconds must be strictly less than 1000000"
                                "\n For instance:"
                                "\n '2530 230 4569'"
                                "\n\n a julian std::string:
format:positive decimal julian day"
                                "\n For instance:"
                                "\n '850.2536985'"
                                "\n\nFor julian std::string, it can
contain its reference date at the end by specifying @YYYY where YYYY is the
reference year"
                                " that's must be one of 1950, 1958,
1985, 1990, 2000"
                                "\nThe reference year YYYY stands for
YYYY-01-01 00:00:00.0"
                                "\nIf no reference date is specified
the default reference date (1950) is used."
                                "\n For instance:"
                                "\n '2530 230 4569@2000'"
                                "\n '850.2536985@1990'"
                                "\n '850.2536985@1950' is equal to
'850.2536985'"
                                "\n\nDates prior to 1950-01-01
00:00:00.0 are invalid",
                                NULL, CDate::CvDate, DateTime),
}

```

### 7.1.3.2 const DefConstant brathl::Constants[] [static]

Initial value:

```

{
    DefConstant("PI",          "PI value",          M_PI),
    DefConstant("PI2",         "PI/2 value",        M_PI_2),
    DefConstant("PI4",         "PI/4 value",        M_PI_4),
    DefConstant("DV",          "Default value",      CTools::m_defaultValueDOUBLE)
,
    DefConstant("dv",          "Default value",      CTools::m_defaultValueDOUBLE)
}

```

### 7.1.3.3 const DefFunction2 brathl::Fonctions2[] [static]

Initial value:

```

{
    DefFunction2("max",          "Calculates the larger of two values",
                CTools::Max,    Statistical),
    DefFunction2("min",          "Calculates the smaller of two values",
                CTools::Min,    Statistical),
    DefFunction2("mod",          "Calculates the floating-point
remainder",
                CTools::Mod),
    DefFunction2("deg_normalize", "Normalizes longitude (degree)",
                CTools::NormalizeLongitude, Geographical),
    DefFunction2("rnd",          "Calculates the rounded value with a
decimal precision (e.g round(20.23645, 3) ==> 20.236)",
                CTools::Rnd,    MathTrigo, false),
}

```

### 7.1.3.4 const DefFunction3 brathl::Fonctions3[] [static]

Initial value:

```
{
    DefFunction3("is_bounded",          "Checks if a value x is
    included between two value (min/max). \nis_bounded(min, x, max)",
        CTools::IsBounded,    Relational),

    DefFunction3("is_bounded_strict",    "Checks if a value x is stricly
    included between two value (min/max). \nis_bounded_strict(min, x, max)",
        CTools::IsBoundedStrict,    Relational),

}
```

#### 7.1.3.5 `const DefFunctionAlgoN brathl::FonctionsAlgoN[]` [static]

**Initial value:**

```
{
    DefFunctionAlgoN("exec",          "Execute an algorithm with
    variable arguments",
        NULL,    Algorithm),
}
```

#### 7.1.3.6 `const DefFunctionBratAlgoBaseN brathl::FonctionsBratAlgoBaseN[]` [static]

**Initial value:**

```
{
    DefFunctionBratAlgoBaseN(
        CBratAlgorithmBase::ExecInternal),
}
```

## 8 Class Documentation

### 8.1 `_structDateDSM` Struct Reference

```
#include <brathl.h>
```

**Public Attributes**

- `int32_t days`
- `int32_t muSeconds`
- **`brathl_refDate refDate`**
- `int32_t seconds`

#### 8.1.1 Detailed Description

Day/seconds/microseconds date structure

#### 8.1.2 Member Data Documentation

##### 8.1.2.1 `int32_t _structDateDSM::days`

numbers of days

Referenced by `brathl_Julian2DSM()`, `brathl_Seconds2DSM()`, `brathl_YMDHMSM2DSM()`, `FTN_NAME()`, and `brathl::CDate::SetDate()`.

8.1.2.2 `int32_t _structDateDSM::muSeconds`

numbers of microseconds

Referenced by `brathl_Julian2DSM()`, `brathl_Seconds2DSM()`, `brathl_YMDHMSM2DSM()`, `FTN_NAME()`, and `brathl::CDate::SetDate()`.

8.1.2.3 `brathl_refDate _structDateDSM::refDate`

date reference (see `brathl_refDate` (p. 338))

Referenced by `brathl_Julian2DSM()`, `brathl_Seconds2DSM()`, `brathl_YMDHMSM2DSM()`, `FTN_NAME()`, and `brathl::CDate::SetDate()`.

8.1.2.4 `int32_t _structDateDSM::seconds`

numbers of seconds

Referenced by `brathl_Julian2DSM()`, `brathl_Seconds2DSM()`, `brathl_YMDHMSM2DSM()`, `FTN_NAME()`, and `brathl::CDate::SetDate()`.

The documentation for this struct was generated from the following file:

- `brathl.h`

8.2 `_structDateJulian` Struct Reference

```
#include <brathl.h>
```

## Public Attributes

- `double julian`
- `brathl_refDate refDate`

## 8.2.1 Detailed Description

Decimal julian date structure

## 8.2.2 Member Data Documentation

8.2.2.1 `double _structDateJulian::julian`

decimal julian day

Referenced by `brathl_DSM2Julian()`, `brathl_Seconds2Julian()`, `brathl_YMDHMSM2Julian()`, `FTN_NAME()`, and `brathl::CDate::SetDate()`.

8.2.2.2 `brathl_refDate _structDateJulian::refDate`

date reference (see `brathl_refDate` (p. 338))

Referenced by `brathl_DSM2Julian()`, `brathl_Seconds2Julian()`, `brathl_YMDHMSM2Julian()`, `FTN_NAME()`, and `brathl::CDate::SetDate()`.

The documentation for this struct was generated from the following file:

- `brathl.h`

### 8.3 `_structDateSecond` Struct Reference

```
#include <brathl.h>
```

#### Public Attributes

- double **nbSeconds**
- **brathl\_refDate** refDate

#### 8.3.1 Detailed Description

Decimal seconds date structure

#### 8.3.2 Member Data Documentation

##### 8.3.2.1 double `_structDateSecond::nbSeconds`

numbers of seconds/microseconds

Referenced by `brathl_DSM2Seconds()`, `brathl_Julian2Seconds()`, `brathl_YMDHMSM2Seconds()`, `FTN_NAME()`, and `brathl::CDate::SetDate()`.

##### 8.3.2.2 **brathl\_refDate** `_structDateSecond::refDate`

date reference (see **brathl\_refDate** (p. 338))

Referenced by `brathl_DSM2Seconds()`, `brathl_Julian2Seconds()`, `brathl_YMDHMSM2Seconds()`, `FTN_NAME()`, and `brathl::CDate::SetDate()`.

The documentation for this struct was generated from the following file:

- **brathl.h**

### 8.4 `_structDateYMDHMSM` Struct Reference

```
#include <brathl.h>
```

#### Public Attributes

- uint32\_t **day**
- uint32\_t **hour**
- uint32\_t **minute**
- uint32\_t **month**
- uint32\_t **muSecond**
- uint32\_t **second**
- uint32\_t **year**

#### 8.4.1 Detailed Description

YYYY-MM-DD HH:MN:SS:MS date structure

The documentation for this struct was generated from the following file:

- **brathl.h**

## 8.5 brathl::CBratAlgoFilterGaussian1D Class Reference

```
#include <BratAlgoFilterGaussian1D.h>
```

Inherits brathl::CBratAlgoFilterGaussian.

### Public Member Functions

- **CBratAlgoFilterGaussian1D** ()
- **CBratAlgoFilterGaussian1D** (const **CBratAlgoFilterGaussian1D** &copy)
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual uint32\_t **GetDataWindowSize** () override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetName** () const override
- **CBratAlgoFilterGaussian1D** & **operator=** (const **CBratAlgoFilterGaussian1D** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual ~**CBratAlgoFilterGaussian1D** ()

### Protected Member Functions

- virtual void **CheckVarExpression** (uint32\_t index) override
- double **ComputeGaussian** ()
- void **Init** ()
- void **Set** (const **CBratAlgoFilterGaussian1D** &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override
- virtual void **SetNextValues** () override
- virtual void **SetPreviousValues** (bool fromProduct) override

### Additional Inherited Members

#### 8.5.1 Detailed Description

Algorithm base class.

#### 8.5.2 Constructor & Destructor Documentation

##### 8.5.2.1 brathl::CBratAlgoFilterGaussian1D::CBratAlgoFilterGaussian1D ( )

Default constructor

##### 8.5.2.2 brathl::CBratAlgoFilterGaussian1D::CBratAlgoFilterGaussian1D ( const CBratAlgoFilterGaussian1D & copy )

Copy constructor

##### 8.5.2.3 virtual brathl::CBratAlgoFilterGaussian1D::~CBratAlgoFilterGaussian1D ( ) [inline],[virtual]

Destructor

#### 8.5.3 Member Function Documentation

##### 8.5.3.1 void brathl::CBratAlgoFilterGaussian1D::Dump ( std::ostream & fOut = std::cerr ) [override],[virtual]

Dump function

Reimplemented from **brathl::CBratAlgorithmBase** (p. 123).

**8.5.3.2** `virtual std::string bratl::CBratAlgoFilterGaussian1D::GetDescription ( ) const [inline],[override], [virtual]`

Gets the description of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

**8.5.3.3** `virtual std::string bratl::CBratAlgoFilterGaussian1D::GetName ( ) const [inline],[override], [virtual]`

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

**8.5.3.4** `CBratAlgoFilterGaussian1D & bratl::CBratAlgoFilterGaussian1D::operator= ( const CBratAlgoFilterGaussian1D & copy )`

Overloads operator '='

**8.5.3.5** `double bratl::CBratAlgoFilterGaussian1D::Run ( CVectorBratAlgorithmParam & args ) [override], [virtual]`

Runs the algorithm

#### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

#### Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

References **bratl::CTools::Format()**.

The documentation for this class was generated from the following files:

- BratAlgoFilterGaussian1D.h
- BratAlgoFilterGaussian1D.cpp

## 8.6 bratl::CBratAlgoFilterGaussian2D Class Reference

`#include <BratAlgoFilterGaussian2D.h>`

Inherits **bratl::CBratAlgoFilterGaussian**.

#### Public Member Functions

- **CBratAlgoFilterGaussian2D** ()
- **CBratAlgoFilterGaussian2D** (const **CBratAlgoFilterGaussian2D** &copy)
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual uint32\_t **GetDataWindowSize** () override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetName** () const override
- **CBratAlgoFilterGaussian2D** & **operator=** (const **CBratAlgoFilterGaussian2D** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual ~**CBratAlgoFilterGaussian2D** ()



## Protected Member Functions

- void **CheckProduct** ()
- virtual void **CheckVarExpression** (uint32\_t index) override
- virtual double **ComputeGaussian** (CExpressionValue &exprValue)
- double **ComputeMean** ()
- double **ComputeSingle** ()
- void **Init** ()
- virtual void **OpenProductFile** () override
- void **Set** (const CBratAlgoFilterGaussian2D &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override

## Additional Inherited Members

## 8.6.1 Detailed Description

Algorithm base class.

## 8.6.2 Constructor &amp; Destructor Documentation

## 8.6.2.1 brathl::CBratAlgoFilterGaussian2D::CBratAlgoFilterGaussian2D ( )

Default constructor

## 8.6.2.2 brathl::CBratAlgoFilterGaussian2D::CBratAlgoFilterGaussian2D ( const CBratAlgoFilterGaussian2D &amp; copy )

Copy constructor

## 8.6.2.3 brathl::CBratAlgoFilterGaussian2D::~~CBratAlgoFilterGaussian2D ( ) [virtual]

Destructor

## 8.6.3 Member Function Documentation

## 8.6.3.1 void brathl::CBratAlgoFilterGaussian2D::Dump ( std::ostream &amp; fOut = std::cerr ) [override], [virtual]

Dump function

Reimplemented from **brathl::CBratAlgorithmBase** (p. 123).

## 8.6.3.2 virtual std::string brathl::CBratAlgoFilterGaussian2D::GetDescription ( ) const [inline], [override], [virtual]

Gets the description of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

## 8.6.3.3 virtual std::string brathl::CBratAlgoFilterGaussian2D::GetName ( ) const [inline], [override], [virtual]

Gets the name of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

### 8.6.3.4 CBratAlgoFilterGaussian2D & bratl::CBratAlgoFilterGaussian2D::operator= ( const CBratAlgoFilterGaussian2D & copy )

Overloads operator '='

### 8.6.3.5 double bratl::CBratAlgoFilterGaussian2D::Run ( CVectorBratAlgorithmParam & args ) [override], [virtual]

Runs the algorithm

#### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

#### Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

The documentation for this class was generated from the following files:

- BratAlgoFilterGaussian2D.h
- BratAlgoFilterGaussian2D.cpp

## 8.7 bratl::CBratAlgoFilterLanczos1D Class Reference

```
#include <BratAlgoFilterLanczos1D.h>
```

Inherits **bratl::CBratAlgoFilterLanczos**.

#### Public Member Functions

- **CBratAlgoFilterLanczos1D** ()
- **CBratAlgoFilterLanczos1D** (const **CBratAlgoFilterLanczos1D** &copy)
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual uint32\_t **GetDataWindowSize** () override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetName** () const override
- **CBratAlgoFilterLanczos1D** & **operator=** (const **CBratAlgoFilterLanczos1D** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual ~**CBratAlgoFilterLanczos1D** ()

#### Protected Member Functions

- virtual void **CheckVarExpression** (uint32\_t index) override
- double **ComputeLanczos** ()
- void **Init** ()
- void **Set** (const **CBratAlgoFilterLanczos1D** &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override
- virtual void **SetNextValues** () override
- virtual void **SetPreviousValues** (bool fromProduct) override

## Additional Inherited Members

## 8.7.1 Detailed Description

Algorithm base class.

## 8.7.2 Constructor &amp; Destructor Documentation

## 8.7.2.1 bratl::CBratAlgoFilterLanczos1D::CBratAlgoFilterLanczos1D ( )

Default constructor

## 8.7.2.2 bratl::CBratAlgoFilterLanczos1D::CBratAlgoFilterLanczos1D ( const CBratAlgoFilterLanczos1D &amp; copy )

Copy constructor

## 8.7.2.3 virtual bratl::CBratAlgoFilterLanczos1D::~CBratAlgoFilterLanczos1D ( ) [inline], [virtual]

Destructor

## 8.7.3 Member Function Documentation

## 8.7.3.1 void bratl::CBratAlgoFilterLanczos1D::Dump ( std::ostream &amp; fOut = std::cerr ) [override], [virtual]

Dump function

Reimplemented from **bratl::CBratAlgorithmBase** (p. 123).

## 8.7.3.2 virtual std::string bratl::CBratAlgoFilterLanczos1D::GetDescription ( ) const [inline], [override], [virtual]

Gets the description of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

## 8.7.3.3 virtual std::string bratl::CBratAlgoFilterLanczos1D::GetName ( ) const [inline], [override], [virtual]

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

## 8.7.3.4 CBratAlgoFilterLanczos1D &amp; bratl::CBratAlgoFilterLanczos1D::operator= ( const CBratAlgoFilterLanczos1D &amp; copy )

Overloads operator '='

## 8.7.3.5 double bratl::CBratAlgoFilterLanczos1D::Run ( CVectorBratAlgorithmParam &amp; args ) [override], [virtual]

Runs the algorithm

## Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

**Returns**

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

References **bratl::CTools::Format()**.

The documentation for this class was generated from the following files:

- BratAlgoFilterLanczos1D.h
- BratAlgoFilterLanczos1D.cpp

**8.8 bratl::CBratAlgoFilterLanczos2D Class Reference**

```
#include <BratAlgoFilterLanczos2D.h>
```

Inherits **bratl::CBratAlgoFilterLanczos**.

**Public Member Functions**

- **CBratAlgoFilterLanczos2D** ()
- **CBratAlgoFilterLanczos2D** (const **CBratAlgoFilterLanczos2D** &copy)
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual uint32\_t **GetDataWindowSize** () override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetName** () const override
- **CBratAlgoFilterLanczos2D** & **operator=** (const **CBratAlgoFilterLanczos2D** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual ~**CBratAlgoFilterLanczos2D** ()

**Protected Member Functions**

- void **CheckProduct** ()
- void **CheckVarExpression** (uint32\_t index) override
- virtual double **ComputeLanczos** (CExpressionValue &exprValue)
- double **ComputeMean** ()
- double **ComputeSingle** ()
- void **Init** ()
- virtual void **OpenProductFile** () override
- void **Set** (const **CBratAlgoFilterLanczos2D** &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override

**Additional Inherited Members****8.8.1 Detailed Description**

Algorithm base class.

**8.8.2 Constructor & Destructor Documentation****8.8.2.1 bratl::CBratAlgoFilterLanczos2D::CBratAlgoFilterLanczos2D ( )**

Default constructor

8.8.2.2 `bratl::CBratAlgoFilterLanczos2D::CBratAlgoFilterLanczos2D ( const CBratAlgoFilterLanczos2D & copy )`

Copy constructor

8.8.2.3 `bratl::CBratAlgoFilterLanczos2D::~~CBratAlgoFilterLanczos2D ( ) [virtual]`

Destructor

### 8.8.3 Member Function Documentation

8.8.3.1 `void bratl::CBratAlgoFilterLanczos2D::Dump ( std::ostream & fOut = std::cerr ) [override], [virtual]`

Dump function

Reimplemented from **bratl::CBratAlgorithmBase** (p. 123).

8.8.3.2 `virtual std::string bratl::CBratAlgoFilterLanczos2D::GetDescription ( ) const [inline], [override], [virtual]`

Gets the description of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

8.8.3.3 `virtual std::string bratl::CBratAlgoFilterLanczos2D::GetName ( ) const [inline], [override], [virtual]`

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

8.8.3.4 `CBratAlgoFilterLanczos2D & bratl::CBratAlgoFilterLanczos2D::operator= ( const CBratAlgoFilterLanczos2D & copy )`

Overloads operator '='

8.8.3.5 `double bratl::CBratAlgoFilterLanczos2D::Run ( CVectorBratAlgorithmParam & args ) [override], [virtual]`

Runs the algorithm

#### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

#### Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

The documentation for this class was generated from the following files:

- BratAlgoFilterLanczos2D.h
- BratAlgoFilterLanczos2D.cpp

## 8.9 bratl::CBratAlgoFilterLoess1D Class Reference

```
#include <BratAlgoFilterLoess1D.h>
```

Inherits brathl::CBratAlgoFilterLoess.

#### Public Member Functions

- **CBratAlgoFilterLoess1D** ()
- **CBratAlgoFilterLoess1D** (const **CBratAlgoFilterLoess1D** &copy)
- virtual void **CheckInputParams** (CVectorBratAlgorithmParam &args) override
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual uint32\_t **GetDataWindowSize** () override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetInputParamDesc** (uint32\_t indexParam) const override
- virtual  
CBratAlgorithmParam::bratAlgoParamTypeVal **GetInputParamFormat** (uint32\_t indexParam) const override
- virtual std::string **GetInputParamUnit** (uint32\_t indexParam) const override
- virtual std::string **GetName** () const override
- virtual uint32\_t **GetNumInputParam** () const override
- virtual std::string **GetOutputUnit** () const override
- virtual double **GetParamDefaultValue** (uint32\_t indexParam) const override
- virtual std::string **GetParamName** (uint32\_t indexParam) const override
- **CBratAlgoFilterLoess1D** & **operator=** (const **CBratAlgoFilterLoess1D** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual void **SetParamValues** (CVectorBratAlgorithmParam &args)
- virtual ~**CBratAlgoFilterLoess1D** ()

#### Protected Member Functions

- double **ApplyFilter** ()
- virtual void **CheckVarExpression** (uint32\_t index) override
- double **ComputeLoess** ()
- void **FitLinearEst** (const double x, const double c0, const double c1, const double cov00, const double cov01, const double cov11, double \*y, double \*y\_err)
- void **FitWLinear** (const double \*x, const uint32\_t xstride, const double \*w, const uint32\_t wstride, const double \*y, const uint32\_t ystride, const uint32\_t n, double \*c0, double \*c1, double \*cov\_00, double \*cov\_01, double \*cov\_11, double \*chisq)
- void **Init** ()
- virtual void **InsertCurrentValueDataWindow1D** () override
- virtual void **RemoveFirstItemDataWindow1D** () override
- void **Set** (const **CBratAlgoFilterLoess1D** &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override
- virtual void **SetNextValues** () override
- virtual void **SetPreviousValues** (bool fromProduct) override
- virtual void **TreatLeftEdge1D** (uint32\_t shiftSymmetry, uint32\_t index) override
- virtual void **TreatRightEdge1D** (uint32\_t shiftSymmetry, uint32\_t index) override
- double **Tricube** (double u, double t)

#### Protected Attributes

- CDoubleArray **m\_distances**
- CDoubleArray **m\_sortedDistances**
- CDoubleArray **m\_xDataWindow**
- double **m\_xValue**
- double **m\_xValueNext**
- double **m\_xValuePrev**

## Static Protected Attributes

- static const uint32\_t **m\_EXTRAPOLATE\_PARAM\_INDEX**
- static const uint32\_t **m\_INPUT\_PARAMS** = 4
- static const uint32\_t **m\_VALID\_PARAM\_INDEX** = 3
- static const uint32\_t **m\_WINDOW\_PARAM\_INDEX** = 2
- static const uint32\_t **m\_X\_PARAM\_INDEX** = 1

## Additional Inherited Members

## 8.9.1 Detailed Description

Algorithm base class.

## 8.9.2 Constructor &amp; Destructor Documentation

## 8.9.2.1 brathl::CBratAlgoFilterLoess1D::CBratAlgoFilterLoess1D ( )

Default constructor

## 8.9.2.2 brathl::CBratAlgoFilterLoess1D::CBratAlgoFilterLoess1D ( const CBratAlgoFilterLoess1D &amp; copy )

Copy constructor

## 8.9.2.3 virtual brathl::CBratAlgoFilterLoess1D::~CBratAlgoFilterLoess1D ( ) [inline], [virtual]

Destructor

## 8.9.3 Member Function Documentation

## 8.9.3.1 void brathl::CBratAlgoFilterLoess1D::Dump ( std::ostream &amp; fOut = std::cerr ) [override], [virtual]

Dump function

Reimplemented from **brathl::CBratAlgorithmBase** (p. 123).

## 8.9.3.2 virtual std::string brathl::CBratAlgoFilterLoess1D::GetDescription ( ) const [inline], [override], [virtual]

Gets the description of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

## 8.9.3.3 virtual std::string brathl::CBratAlgoFilterLoess1D::GetInputParamDesc ( uint32\_t indexParam ) const [inline], [override], [virtual]

Gets the description of an input parameter.

## Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

**8.9.3.4** virtual CBratAlgorithmParam::bratAlgoParamTypeVal bratl::CBratAlgoFilterLoess1D::GetInputParamFormat ( uint32\_t *indexParam* ) const [inline],[override],[virtual]

Gets the format of an input parameter : CBratAlgorithmParam::T\_DOUBLE for double CBratAlgorithmParam::T\_FLOAT for float CBratAlgorithmParam::T\_INT for integer CBratAlgorithmParam::T\_LONG for long integer CBratAlgorithmParam::T\_STRING for std::string CBratAlgorithmParam::T\_CHAR for a character

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **bratl::CBratAlgorithmBase** (p. 124).

References bratl::CTools::Format().

**8.9.3.5** virtual std::string bratl::CBratAlgoFilterLoess1D::GetInputParamUnit ( uint32\_t *indexParam* ) const [inline],[override],[virtual]

Gets the unit of an input parameter :

#### Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **bratl::CBratAlgorithmBase** (p. 124).

References bratl::CTools::Format().

**8.9.3.6** virtual std::string bratl::CBratAlgoFilterLoess1D::GetName ( ) const [inline],[override],[virtual]

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

**8.9.3.7** virtual uint32\_t bratl::CBratAlgoFilterLoess1D::GetNumInputParam ( ) const [inline],[override],[virtual]

Gets the number of input parameters to pass to the 'Run' function

Implements **bratl::CBratAlgorithmBase** (p. 125).

**8.9.3.8** virtual std::string bratl::CBratAlgoFilterLoess1D::GetOutputUnit ( ) const [inline],[override],[virtual]

Gets the unit of an output value returned by the 'Run' function.

#### Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **bratl::CBratAlgorithmBase** (p. 125).

**8.9.3.9** CBratAlgoFilterLoess1D & bratl::CBratAlgoFilterLoess1D::operator= ( const CBratAlgoFilterLoess1D & *copy* )

Overloads operator '='

**8.9.3.10** double bratl::CBratAlgoFilterLoess1D::Run ( CVectorBratAlgorithmParam & *args* ) [override],[virtual]

Runs the algorithm



## Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

## Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

References **bratl::CTools::Format()**.

The documentation for this class was generated from the following files:

- BratAlgoFilterLoess1D.h
- BratAlgoFilterLoess1D.cpp

## 8.10 bratl::CBratAlgoFilterLoess2D Class Reference

```
#include <BratAlgoFilterLoess2D.h>
```

Inherits **bratl::CBratAlgoFilterLoess**.

## Public Member Functions

- **CBratAlgoFilterLoess2D** ()
- **CBratAlgoFilterLoess2D** (const **CBratAlgoFilterLoess2D** &copy)
- virtual void **CheckInputParams** (CVectorBratAlgorithmParam &args) override
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual uint32\_t **GetDataWindowSize** () override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetInputParamDesc** (uint32\_t indexParam) const override
- virtual  
CBratAlgorithmParam::bratAlgoParamTypeVal **GetInputParamFormat** (uint32\_t indexParam) const override
- virtual std::string **GetInputParamUnit** (uint32\_t indexParam) const override
- virtual std::string **GetName** () const override
- virtual uint32\_t **GetNumInputParam** () const override
- virtual std::string **GetOutputUnit** () const override
- virtual double **GetParamDefaultValue** (uint32\_t indexParam) const override
- virtual std::string **GetParamName** (uint32\_t indexParam) const override
- **CBratAlgoFilterLoess2D** & **operator=** (const **CBratAlgoFilterLoess2D** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual void **SetParamValues** (CVectorBratAlgorithmParam &args)
- virtual ~**CBratAlgoFilterLoess2D** ()

## Protected Member Functions

- double **ApplyFilter** ()
- void **CheckProduct** ()
- void **CheckVarExpression** (uint32\_t index) override
- void **ComputeInitialWeights** ()
- double **ComputeLoess** ()
- double **ComputeMean** ()
- double **ComputeSingle** ()

- void **Init** ()
- virtual void **OpenProductFile** () override
- void **PrepareDataValues** ()
- void **PrepareDataWindow** ()
- void **Set** (const **CBratAlgoFilterLoess2D** &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override

#### Static Protected Attributes

- static const uint32\_t **m\_EXTRAPOLATE\_PARAM\_INDEX** = 4
- static const uint32\_t **m\_INPUT\_PARAMS** = 5
- static const uint32\_t **m\_VALID\_PARAM\_INDEX** = 3
- static const uint32\_t **m\_WINDOW\_HEIGHT\_PARAM\_INDEX** = 2
- static const uint32\_t **m\_WINDOW\_WIDTH\_PARAM\_INDEX** = 1

#### Additional Inherited Members

##### 8.10.1 Detailed Description

Algorithm base class.

##### 8.10.2 Constructor & Destructor Documentation

###### 8.10.2.1 brathl::CBratAlgoFilterLoess2D::CBratAlgoFilterLoess2D ( )

Default constructor

###### 8.10.2.2 brathl::CBratAlgoFilterLoess2D::CBratAlgoFilterLoess2D ( const **CBratAlgoFilterLoess2D** &copy )

Copy constructor

###### 8.10.2.3 brathl::CBratAlgoFilterLoess2D::~~CBratAlgoFilterLoess2D ( ) [virtual]

Destructor

##### 8.10.3 Member Function Documentation

###### 8.10.3.1 void brathl::CBratAlgoFilterLoess2D::Dump ( std::ostream & fOut = std::cerr ) [override], [virtual]

Dump function

Reimplemented from **brathl::CBratAlgorithmBase** (p. 123).

###### 8.10.3.2 virtual std::string brathl::CBratAlgoFilterLoess2D::GetDescription ( ) const [inline], [override], [virtual]

Gets the description of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

###### 8.10.3.3 virtual std::string brathl::CBratAlgoFilterLoess2D::GetInputParamDesc ( uint32\_t indexParam ) const [inline], [override], [virtual]

Gets the description of an input parameter.

## Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

8.10.3.4 **virtual CBratAlgorithmParam::bratAlgoParamTypeVal brathl::CBratAlgoFilterLoess2D::GetInputParamFormat ( uint32\_t indexParam ) const** [inline],[override],[virtual]

Gets the format of an input parameter : CBratAlgorithmParam::T\_DOUBLE for double CBratAlgorithmParam::T\_FLOAT for float CBratAlgorithmParam::T\_INT for integer CBratAlgorithmParam::T\_LONG for long integer CBratAlgorithmParam::T\_STRING for std::string CBratAlgorithmParam::T\_CHAR for a character

## Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

8.10.3.5 **virtual std::string brathl::CBratAlgoFilterLoess2D::GetInputParamUnit ( uint32\_t indexParam ) const** [inline],[override],[virtual]

Gets the unit of an input parameter :

## Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

8.10.3.6 **virtual std::string brathl::CBratAlgoFilterLoess2D::GetName ( ) const** [inline],[override],[virtual]

Gets the name of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

8.10.3.7 **virtual uint32\_t brathl::CBratAlgoFilterLoess2D::GetNumInputParam ( ) const** [inline],[override],[virtual]

Gets the number of input parameters to pass to the 'Run' function

Implements **brathl::CBratAlgorithmBase** (p. 125).

8.10.3.8 **virtual std::string brathl::CBratAlgoFilterLoess2D::GetOutputUnit ( ) const** [inline],[override],[virtual]

Gets the unit of an output value returned by the 'Run' function.

## Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **brathl::CBratAlgorithmBase** (p. 125).

#### 8.10.3.9 CBratAlgoFilterLoess2D & bratl::CBratAlgoFilterLoess2D::operator= ( const CBratAlgoFilterLoess2D & copy )

Overloads operator '='

#### 8.10.3.10 double bratl::CBratAlgoFilterLoess2D::Run ( CVectorBratAlgorithmParam & args ) [override], [virtual]

Runs the algorithm

##### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

##### Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

The documentation for this class was generated from the following files:

- BratAlgoFilterLoess2D.h
- BratAlgoFilterLoess2D.cpp

## 8.11 bratl::CBratAlgoFilterMedian1D Class Reference

```
#include <BratAlgoFilterMedian1D.h>
```

Inherits **bratl::CBratAlgoFilterMedian**.

##### Public Member Functions

- **CBratAlgoFilterMedian1D** ()
- **CBratAlgoFilterMedian1D** (const **CBratAlgoFilterMedian1D** &copy)
- virtual void **CheckInputParams** (CVectorBratAlgorithmParam &args) override
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual uint32\_t **GetDataWindowSize** () override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetInputParamDesc** (uint32\_t indexParam) const override
- virtual CBratAlgorithmParam::bratAlgoParamTypeVal **GetInputParamFormat** (uint32\_t indexParam) const override
- virtual std::string **GetInputParamUnit** (uint32\_t indexParam) const override
- virtual std::string **GetName** () const override
- virtual uint32\_t **GetNumInputParam** () const override
- virtual std::string **GetOutputUnit** () const override
- virtual double **GetParamDefaultValue** (uint32\_t indexParam)
- virtual std::string **GetParamName** (uint32\_t indexParam) const override
- **CBratAlgoFilterMedian1D** & **operator=** (const **CBratAlgoFilterMedian1D** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual void **SetParamValues** (CVectorBratAlgorithmParam &args)
- virtual ~**CBratAlgoFilterMedian1D** ()

## Protected Member Functions

- virtual void **CheckVarExpression** (uint32\_t index) override
- void **Init** ()
- void **Set** (const **CBratAlgoFilterMedian1D** &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override
- virtual void **SetNextValues** () override
- virtual void **SetPreviousValues** (bool fromProduct) override

## Static Protected Attributes

- static const uint32\_t **m\_EXTRAPOLATE\_PARAM\_INDEX** = 3
- static const uint32\_t **m\_INPUT\_PARAMS** = 4
- static const uint32\_t **m\_VALID\_PARAM\_INDEX** = 2
- static const uint32\_t **m\_WINDOW\_PARAM\_INDEX** = 1

## Additional Inherited Members

## 8.11.1 Detailed Description

Algorithm base class.

## 8.11.2 Constructor &amp; Destructor Documentation

## 8.11.2.1 brathl::CBratAlgoFilterMedian1D::CBratAlgoFilterMedian1D ( )

Default constructor

8.11.2.2 brathl::CBratAlgoFilterMedian1D::CBratAlgoFilterMedian1D ( const **CBratAlgoFilterMedian1D** &copy )

Copy constructor

## 8.11.2.3 virtual brathl::CBratAlgoFilterMedian1D::~CBratAlgoFilterMedian1D ( ) [inline], [virtual]

Destructor

## 8.11.3 Member Function Documentation

## 8.11.3.1 void brathl::CBratAlgoFilterMedian1D::Dump ( std::ostream &amp; fOut = std::cerr ) [override], [virtual]

Dump function

Reimplemented from **brathl::CBratAlgorithmBase** (p. 123).

## 8.11.3.2 virtual std::string brathl::CBratAlgoFilterMedian1D::GetDescription ( ) const [inline], [override], [virtual]

Gets the description of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

## 8.11.3.3 virtual std::string brathl::CBratAlgoFilterMedian1D::GetInputParamDesc ( uint32\_t indexParam ) const [inline], [override], [virtual]

Gets the description of an input parameter.

## Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

8.11.3.4 `virtual CBratAlgorithmParam::bratAlgoParamTypeVal brathl::CBratAlgoFilterMedian1D::GetInputParamFormat ( uint32_t indexParam ) const [inline],[override],[virtual]`

Gets the format of an input parameter : CBratAlgorithmParam::T\_DOUBLE for double CBratAlgorithmParam::T\_FLOAT for float CBratAlgorithmParam::T\_INT for integer CBratAlgorithmParam::T\_LONG for long integer CBratAlgorithmParam::T\_STRING for std::string CBratAlgorithmParam::T\_CHAR for a character

## Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

8.11.3.5 `virtual std::string brathl::CBratAlgoFilterMedian1D::GetInputParamUnit ( uint32_t indexParam ) const [inline],[override],[virtual]`

Gets the unit of an input parameter :

## Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **brathl::CBratAlgorithmBase** (p. 124).

References **brathl::CTools::Format()**.

8.11.3.6 `virtual std::string brathl::CBratAlgoFilterMedian1D::GetName ( ) const [inline],[override],[virtual]`

Gets the name of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

8.11.3.7 `virtual uint32_t brathl::CBratAlgoFilterMedian1D::GetNumInputParam ( ) const [inline],[override],[virtual]`

Gets the number of input parameters to pass to the 'Run' function

Implements **brathl::CBratAlgorithmBase** (p. 125).

8.11.3.8 `virtual std::string brathl::CBratAlgoFilterMedian1D::GetOutputUnit ( ) const [inline],[override],[virtual]`

Gets the unit of an output value returned by the 'Run' function.

## Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **brathl::CBratAlgorithmBase** (p. 125).

### 8.11.3.9 CBratAlgoFilterMedian1D & bratl::CBratAlgoFilterMedian1D::operator= ( const CBratAlgoFilterMedian1D & copy )

Overloads operator '='

### 8.11.3.10 double bratl::CBratAlgoFilterMedian1D::Run ( CVectorBratAlgorithmParam & args ) [override], [virtual]

Runs the algorithm

#### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

#### Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

References **bratl::CTools::Format()**.

The documentation for this class was generated from the following files:

- BratAlgoFilterMedian1D.h
- BratAlgoFilterMedian1D.cpp

## 8.12 bratl::CBratAlgoFilterMedian2D Class Reference

#include <BratAlgoFilterMedian2D.h>

Inherits **bratl::CBratAlgoFilterMedian**.

#### Public Member Functions

- **CBratAlgoFilterMedian2D** ()
- **CBratAlgoFilterMedian2D** (const **CBratAlgoFilterMedian2D** &copy)
- virtual void **CheckInputParams** (CVectorBratAlgorithmParam &args) override
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual uint32\_t **GetDataWindowSize** () override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetInputParamDesc** (uint32\_t indexParam) const override
- virtual CBratAlgorithmParam::bratAlgoParamTypeVal **GetInputParamFormat** (uint32\_t indexParam) const override
- virtual std::string **GetInputParamUnit** (uint32\_t indexParam) const override
- virtual std::string **GetName** () const override
- virtual uint32\_t **GetNumInputParam** () const override
- virtual std::string **GetOutputUnit** () const override
- virtual double **GetParamDefaultValue** (uint32\_t indexParam) const override
- virtual std::string **GetParamName** (uint32\_t indexParam) const override
- **CBratAlgoFilterMedian2D** & **operator=** (const **CBratAlgoFilterMedian2D** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual void **SetParamValues** (CVectorBratAlgorithmParam &args)
- virtual ~**CBratAlgoFilterMedian2D** ()

## Protected Member Functions

- void **CheckProduct** ()
- void **CheckVarExpression** (uint32\_t index) override
- double **ComputeMean** ()
- double **ComputeSingle** ()
- void **Init** ()
- virtual void **OpenProductFile** () override
- void **PrepareDataValues** ()
- void **PrepareDataWindow** ()
- void **Set** (const **CBratAlgoFilterMedian2D** &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override

## Static Protected Attributes

- static const uint32\_t **m\_EXTRAPOLATE\_PARAM\_INDEX** = 4
- static const uint32\_t **m\_INPUT\_PARAMS** = 5
- static const uint32\_t **m\_VALID\_PARAM\_INDEX** = 3
- static const uint32\_t **m\_WINDOW\_HEIGHT\_PARAM\_INDEX** = 2
- static const uint32\_t **m\_WINDOW\_WIDTH\_PARAM\_INDEX** = 1

## Additional Inherited Members

## 8.12.1 Detailed Description

Algorithm base class.

## 8.12.2 Constructor &amp; Destructor Documentation

## 8.12.2.1 bratl::CBratAlgoFilterMedian2D::CBratAlgoFilterMedian2D ( )

Default constructor

8.12.2.2 bratl::CBratAlgoFilterMedian2D::CBratAlgoFilterMedian2D ( const **CBratAlgoFilterMedian2D** &copy )

Copy constructor

## 8.12.2.3 bratl::CBratAlgoFilterMedian2D::~~CBratAlgoFilterMedian2D ( ) [virtual]

Destructor

## 8.12.3 Member Function Documentation

## 8.12.3.1 void bratl::CBratAlgoFilterMedian2D::Dump ( std::ostream &amp; fOut = std::cerr ) [override], [virtual]

Dump function

Reimplemented from **bratl::CBratAlgorithmBase** (p. 123).

## 8.12.3.2 virtual std::string bratl::CBratAlgoFilterMedian2D::GetDescription ( ) const [inline], [override], [virtual]

Gets the description of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).



8.12.3.3 `virtual std::string bratl::CBratAlgoFilterMedian2D::GetInputParamDesc ( uint32_t indexParam ) const` `[inline]`, `[override]`, `[virtual]`

Gets the description of an input parameter.

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **bratl::CBratAlgorithmBase** (p. 124).

References **bratl::CTools::Format()**.

8.12.3.4 `virtual CBratAlgorithmParam::bratAlgoParamTypeVal bratl::CBratAlgoFilterMedian2D::GetInputParamFormat ( uint32_t indexParam ) const` `[inline]`, `[override]`, `[virtual]`

Gets the format of an input parameter : CBratAlgorithmParam::T\_DOUBLE for double CBratAlgorithmParam::T\_FLOAT for float CBratAlgorithmParam::T\_INT for integer CBratAlgorithmParam::T\_LONG for long integer CBratAlgorithmParam::T\_STRING for std::string CBratAlgorithmParam::T\_CHAR for a character

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **bratl::CBratAlgorithmBase** (p. 124).

References **bratl::CTools::Format()**.

8.12.3.5 `virtual std::string bratl::CBratAlgoFilterMedian2D::GetInputParamUnit ( uint32_t indexParam ) const` `[inline]`, `[override]`, `[virtual]`

Gets the unit of an input parameter :

#### Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **bratl::CBratAlgorithmBase** (p. 124).

References **bratl::CTools::Format()**.

8.12.3.6 `virtual std::string bratl::CBratAlgoFilterMedian2D::GetName ( ) const` `[inline]`, `[override]`, `[virtual]`

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

8.12.3.7 `virtual uint32_t bratl::CBratAlgoFilterMedian2D::GetNumInputParam ( ) const` `[inline]`, `[override]`, `[virtual]`

Gets the number of input parameters to pass to the 'Run' function

Implements **bratl::CBratAlgorithmBase** (p. 125).

8.12.3.8 `virtual std::string bratl::CBratAlgoFilterMedian2D::GetOutputUnit ( ) const` `[inline]`, `[override]`, `[virtual]`

Gets the unit of an output value returned by the 'Run' function.

#### Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **bratl::CBratAlgorithmBase** (p. 125).

#### 8.12.3.9 CBratAlgoFilterMedian2D & bratl::CBratAlgoFilterMedian2D::operator= ( const CBratAlgoFilterMedian2D & copy )

Overloads operator '='

#### 8.12.3.10 double bratl::CBratAlgoFilterMedian2D::Run ( CVectorBratAlgorithmParam & args ) [override], [virtual]

Runs the algorithm

##### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

##### Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

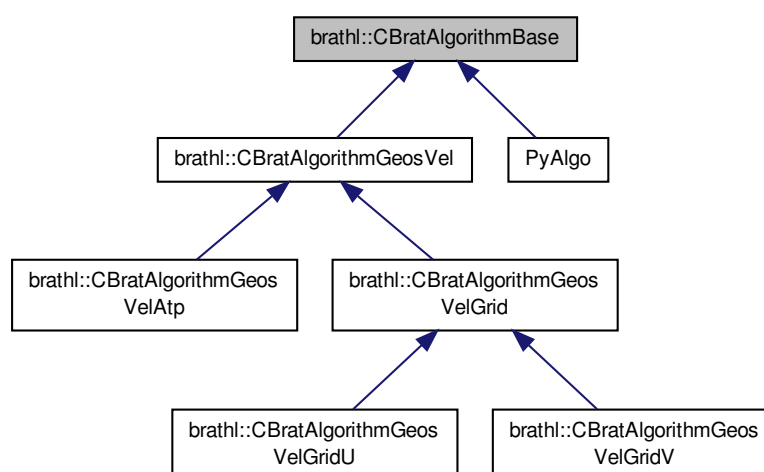
The documentation for this class was generated from the following files:

- BratAlgoFilterMedian2D.h
- BratAlgoFilterMedian2D.cpp

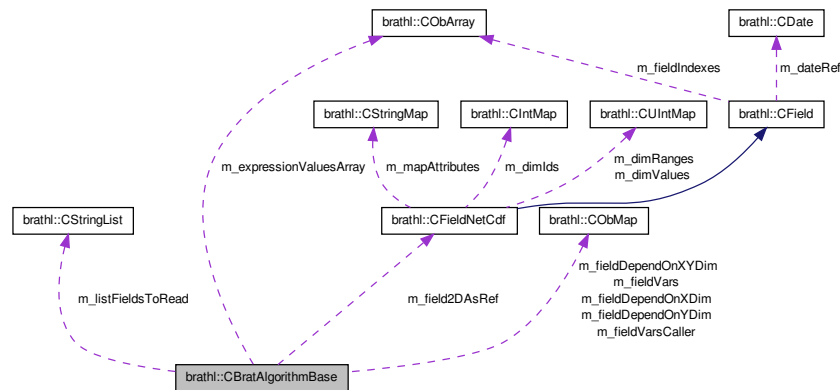
## 8.13 bratl::CBratAlgorithmBase Class Reference

```
#include <BratAlgorithmBase.h>
```

Inheritance diagram for bratl::CBratAlgorithmBase:



Collaboration diagram for brathl::CBratAlgorithmBase:



## Public Member Functions

- **CBratAlgorithmBase** ()
- **CBratAlgorithmBase** (const **CBratAlgorithmBase** &o)
- void **CheckConstantParam** (uint32\_t indexParam)
- virtual void **CheckInputParams** (CVectorBratAlgorithmParam &args)
- virtual void **CheckInputTypeParams** (uint32\_t index, CBratAlgorithmParam::bratAlgoParamTypeVal expectedType, CVectorBratAlgorithmParam &args)
- virtual void **CheckInputTypeParams** (uint32\_t index, const CIntArray &expectedTypes, CVectorBratAlgorithmParam &args)
- virtual void **Dump** (std::ostream &fOut=std::cerr)
- std::string **GetAlgoExpression** ()
- **CObArray** \* **GetAlgoParamExpressions** ()
- virtual std::string **GetDescription** () const =0
- virtual std::string **GetInputParamDesc** (uint32\_t indexParam) const =0
- std::string **GetInputParamDescWithDefValueLabel** (uint32\_t indexParam)
- virtual  
CBratAlgorithmParam::bratAlgoParamTypeVal **GetInputParamFormat** (uint32\_t indexParam) const =0
- virtual std::string **GetInputParamFormatAsString** (uint32\_t indexParam)
- virtual std::string **GetInputParamUnit** (uint32\_t indexParam) const =0
- virtual std::string **GetName** () const =0
- virtual uint32\_t **GetNumInputParam** () const =0
- virtual std::string **GetOutputUnit** () const =0
- virtual double **GetParamDefaultValue** (uint32\_t) const
- void **GetParamDefValue** (uint32\_t indexParam, double &value)
- void **GetParamDefValue** (uint32\_t indexParam, float &value)
- void **GetParamDefValue** (uint32\_t indexParam, uint32\_t &value)
- void **GetParamDefValue** (uint32\_t indexParam, uint64\_t &value)
- void **GetParamDefValue** (uint32\_t indexParam, int32\_t &value)
- void **GetParamDefValue** (uint32\_t indexParam, int64\_t &value)
- std::string **GetParamDefValueAsLabel** (uint32\_t indexParam)
- std::string **GetParamDefValueAsString** (uint32\_t indexParam)
- virtual std::string **GetParamName** (uint32\_t) const =0
- **CProductNetCdf** \* **GetProductNetCdf** (CProduct \*product)
- std::string **GetSyntax** () const
- **CBratAlgorithmBase** & **operator=** (const **CBratAlgorithmBase** &o)

- virtual double **Run** (CVectorBratAlgorithmParam &args)=0
- void **SetAlgoExpression** (const std::string &value)
- void **SetAlgoParamExpressions** (const CStringArray &values)
- void **SetAlgoParamExpressions** (const CObArray &obArray)
- virtual void **SetProduct** (CProduct \*product, bool forceReplace=false)
- virtual ~**CBratAlgorithmBase** ()

#### Static Public Member Functions

- static double **ExecInternal** (CBratAlgorithmBase \*algo, CVectorBratAlgorithmParam &arg)
- static **CBratAlgorithmBase** \* **GetNew** (const char \*algorithmName)
- static void **RegisterCAlgorithms** ()

#### Protected Member Functions

- void **AddXOrYFieldDependency** (CFieldNetCdf \*field, CFieldNetCdf \*field2DAsRef)
- void **AddXOrYFieldDependency** (CFieldNetCdf \*field, const std::string &xDimName, const std::string &yDimName)
- virtual void **CheckComplexExpression** (uint32\_t index)
- virtual void **CheckVarExpression2D** (uint32\_t index)
- virtual void **DeleteExpressionValuesArray** ()
- virtual void **DeleteFieldNetCdf** ()
- virtual void **DeleteProduct** ()
- virtual void **GetAllData** (CExpression \*expression, CDoubleArray &data)
- virtual void **GetData1D** (int32\_t iRecord)
- **CObArray** \* **GetDataExpressionValues** (uint32\_t indexExpr)
- double **GetDataValue** (uint32\_t indexExpr)
- double **GetDataValue** (uint32\_t indexExpr, uint32\_t x)
- double **GetDataValue** (uint32\_t indexExpr, uint32\_t x, uint32\_t y)
- void **GetExpressionDataValuesAsArrayOfSingleValue** (uint32\_t indexExpr, double \*&values, uint32\_t &nbValues)
- **CFieldNetCdf** \* **GetField2DAsRef** ()
- virtual void **GetNextData** ()
- void **Init** ()
- void **InitComplexExpressionArray** ()
- virtual void **NewExpressionValuesArray** ()
- virtual void **OpenProductFile** ()
- virtual void **OpenProductFile** (CProduct \*product)
- virtual void **PrepareDataValues2DComplexExpression** (CExpressionValue &exprValue, uint32\_t algoExprIndex)
- virtual void **PrepareDataValues2DComplexExpressionWithAlgo** (CExpressionValue &exprValue, uint32\_t algoExprIndex)
- virtual void **PrepareDataValues2DOneField** (CExpressionValue &exprValue, uint32\_t algoExprIndex)
- virtual void **ProcessOpeningProductNetCdf** ()
- virtual void **ProcessOpeningProductNetCdf** (CProduct \*product)
- virtual uint32\_t **ReadProductData** (int32\_t iRecord)
- virtual uint32\_t **ReadProductData** (int32\_t iRecord, CExpression \*expression)
- virtual uint32\_t **ReadProductData** (int32\_t iRecord, const CObArrayOb &algoParamExpressions)
- virtual uint32\_t **ReadProductData** (CProduct \*product, int32\_t iRecord, const CObArrayOb &arrayExpressions)
- void **Set** (const CBratAlgorithmBase &o)
- virtual void **SetBeginOfFile** ()
- virtual void **SetEndOfFile** ()
- void **SetField2DAsRef** ()
- virtual void **SetNextValues** ()
- virtual void **SetPreviousValues** (bool fromProduct)

## Protected Attributes

- std::string **m\_algoExpression**
- CObArrayOb **m\_algoParamExpressions**
- CProduct \* **m\_callerProduct**
- int32\_t **m\_callerProductRecordPrev**
- std::string **m\_currentFileName**
- CIntArray **m\_expectedTypes**
- CObArray \* **m\_expressionValuesArray**
- CFieldNetCdf \* **m\_field2DAsRef**
- CObMap **m\_fieldDependOnXDim**
- CObMap **m\_fieldDependOnXYDim**
- CObMap **m\_fieldDependOnYDim**
- CObMap **m\_fieldVars**
- CObMap **m\_fieldVarsCaller**
- int32\_t **m\_indexRecordToRead**
- std::vector< bool > **m\_isComplexExpression**
- std::vector< bool > **m\_isComplexExpressionWithAlgo**
- CStringList **m\_listFieldsToRead**
- int32\_t **m\_nProductRecords**
- CProduct \* **m\_product**
- CDoubleArray \* **m\_varValueArray**

## Static Protected Attributes

- static bool **m\_algorithmsRegistered** = false

## 8.13.1 Detailed Description

Algorithm base class.

## 8.13.2 Constructor &amp; Destructor Documentation

## 8.13.2.1 bratl::CBratAlgorithmBase::CBratAlgorithmBase ( )

Default constructor

## 8.13.2.2 bratl::CBratAlgorithmBase::CBratAlgorithmBase ( const CBratAlgorithmBase &amp; o )

Copy constructor

## 8.13.2.3 bratl::CBratAlgorithmBase::~~CBratAlgorithmBase ( ) [virtual]

Destructor

## 8.13.3 Member Function Documentation

## 8.13.3.1 void bratl::CBratAlgorithmBase::Dump ( std::ostream &amp; fOut = std::cerr ) [virtual]

Dump function

Reimplemented in **bratl::CBratAlgorithmGeosVelGridV** (p. 14), **bratl::CBratAlgorithmGeosVelGridU** (p. 14), **bratl::CBratAlgoFilterLoess1D** (p. 109), **bratl::CBratAlgoFilterLoess2D** (p. 112), **bratl::CBratAlgoFilterMedian2D** (p. 118), **bratl::CBratAlgoFilterMedian1D** (p. 115), **bratl::CBratAlgorithmGeosVelGrid** (p. 14),

**bratl::CBratAlgorithmGeosVelAtp** (p. 130), **bratl::CBratAlgoFilterGaussian2D** (p. 103), **bratl::CBratAlgoFilterLanczos2D** (p. 107), **bratl::CBratAlgoFilterGaussian1D** (p. 101), **bratl::CBratAlgoFilterLanczos1D** (p. 105), and **bratl::CBratAlgorithmGeosVel** (p. 128).

Referenced by `bratl::CBratAlgorithmGeosVel::Dump()`.

8.13.3.2 `virtual std::string bratl::CBratAlgorithmBase::GetDescription ( ) const [pure virtual]`

Gets the description of the algorithm

Implemented in **PyAlgo** (p. 333), **bratl::CBratAlgorithmGeosVelGridV** (p. 15), **bratl::CBratAlgorithmGeosVelGridU** (p. 15), **bratl::CBratAlgoFilterGaussian1D** (p. 102), **bratl::CBratAlgoFilterGaussian2D** (p. 103), **bratl::CBratAlgoFilterLanczos1D** (p. 105), **bratl::CBratAlgoFilterLanczos2D** (p. 107), **bratl::CBratAlgoFilterLoess1D** (p. 109), **bratl::CBratAlgoFilterLoess2D** (p. 112), **bratl::CBratAlgoFilterMedian1D** (p. 115), **bratl::CBratAlgoFilterMedian2D** (p. 118), and **bratl::CBratAlgorithmGeosVelAtp** (p. 130).

8.13.3.3 `virtual std::string bratl::CBratAlgorithmBase::GetInputParamDesc ( uint32_t indexParam ) const [pure virtual]`

Gets the description of an input parameter.

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
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Implemented in **PyAlgo** (p. 333), **bratl::CBratAlgoFilterLoess1D** (p. 109), **bratl::CBratAlgoFilterLoess2D** (p. 112), **bratl::CBratAlgoFilterMedian1D** (p. 115), **bratl::CBratAlgoFilterMedian2D** (p. 119), **bratl::CBratAlgorithmGeosVelAtp** (p. 131), and **bratl::CBratAlgorithmGeosVelGrid** (p. 15).

8.13.3.4 `virtual CBratAlgorithmParam::bratAlgoParamTypeVal bratl::CBratAlgorithmBase::GetInputParamFormat ( uint32_t indexParam ) const [pure virtual]`

Gets the format of an input parameter : `CBratAlgorithmParam::T_DOUBLE` for double `CBratAlgorithmParam::T_FLOAT` for float `CBratAlgorithmParam::T_INT` for integer `CBratAlgorithmParam::T_LONG` for long integer `CBratAlgorithmParam::T_STRING` for `std::string` `CBratAlgorithmParam::T_CHAR` for a character

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implemented in **PyAlgo** (p. 334), **bratl::CBratAlgoFilterLoess1D** (p. 110), **bratl::CBratAlgoFilterLoess2D** (p. 113), **bratl::CBratAlgoFilterMedian2D** (p. 119), **bratl::CBratAlgoFilterMedian1D** (p. 116), **bratl::CBratAlgorithmGeosVelAtp** (p. 131), and **bratl::CBratAlgorithmGeosVelGrid** (p. 15).

8.13.3.5 `virtual std::string bratl::CBratAlgorithmBase::GetInputParamUnit ( uint32_t indexParam ) const [pure virtual]`

Gets the unit of an input parameter :

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implemented in **PyAlgo** (p. 334), **bratl::CBratAlgoFilterLoess1D** (p. 110), **bratl::CBratAlgoFilterLoess2D** (p. 113), **bratl::CBratAlgoFilterMedian2D** (p. 119), **bratl::CBratAlgoFilterMedian1D** (p. 116), **bratl::CBratAlgorithmGeosVelAtp** (p. 131), and **bratl::CBratAlgorithmGeosVelGrid** (p. 15).

8.13.3.6 `virtual std::string bratl::CBratAlgorithmBase::GetName ( ) const [pure virtual]`

Gets the name of the algorithm

Implemented in **PyAlgo** (p. 334), **bratl::CBratAlgorithmGeosVelGridV** (p. 16), **bratl::CBratAlgorithmGeos-**

**VelGridU** (p. 15), **bratl::CBratAlgoFilterGaussian1D** (p. 102), **bratl::CBratAlgoFilterGaussian2D** (p. 103), **bratl::CBratAlgoFilterLanczos1D** (p. 105), **bratl::CBratAlgoFilterLanczos2D** (p. 107), **bratl::CBratAlgoFilterLoess1D** (p. 110), **bratl::CBratAlgoFilterLoess2D** (p. 113), **bratl::CBratAlgoFilterMedian1D** (p. 116), **bratl::CBratAlgoFilterMedian2D** (p. 119), and **bratl::CBratAlgorithmGeosVelAtp** (p. 131).

8.13.3.7 `virtual uint32_t bratl::CBratAlgorithmBase::GetNumInputParam ( ) const [pure virtual]`

Gets the number of input parameters to pass to the 'Run' function

Implemented in **PyAlgo** (p. 334), **bratl::CBratAlgoFilterLoess1D** (p. 110), **bratl::CBratAlgoFilterLoess2D** (p. 113), **bratl::CBratAlgoFilterMedian1D** (p. 116), **bratl::CBratAlgoFilterMedian2D** (p. 119), **bratl::CBratAlgorithmGeosVelAtp** (p. 131), and **bratl::CBratAlgorithmGeosVelGrid** (p. 16).

8.13.3.8 `virtual std::string bratl::CBratAlgorithmBase::GetOutputUnit ( ) const [pure virtual]`

Gets the unit of an output value returned by the 'Run' function.

Implemented in **PyAlgo** (p. 334), **bratl::CBratAlgoFilterLoess1D** (p. 110), **bratl::CBratAlgoFilterLoess2D** (p. 113), **bratl::CBratAlgoFilterMedian2D** (p. 119), **bratl::CBratAlgoFilterMedian1D** (p. 116), **bratl::CBratAlgorithmGeosVelAtp** (p. 131), and **bratl::CBratAlgorithmGeosVelGrid** (p. 16).

8.13.3.9 `CBratAlgorithmBase & bratl::CBratAlgorithmBase::operator= ( const CBratAlgorithmBase & o )`

Overloads operator '='

8.13.3.10 `virtual double bratl::CBratAlgorithmBase::Run ( CVectorBratAlgorithmParam & args ) [pure virtual]`

Runs the algorithm

#### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

#### Returns

the result of the execution

Implemented in **PyAlgo** (p. 335), **bratl::CBratAlgoFilterLoess1D** (p. 110), **bratl::CBratAlgoFilterLoess2D** (p. 114), **bratl::CBratAlgoFilterMedian2D** (p. 120), **bratl::CBratAlgoFilterMedian1D** (p. 117), **bratl::CBratAlgorithmGeosVelAtp** (p. 132), **bratl::CBratAlgorithmGeosVelGrid** (p. 16), **bratl::CBratAlgoFilterGaussian1D** (p. 102), **bratl::CBratAlgoFilterGaussian2D** (p. 104), **bratl::CBratAlgoFilterLanczos1D** (p. 105), and **bratl::CBratAlgoFilterLanczos2D** (p. 107).

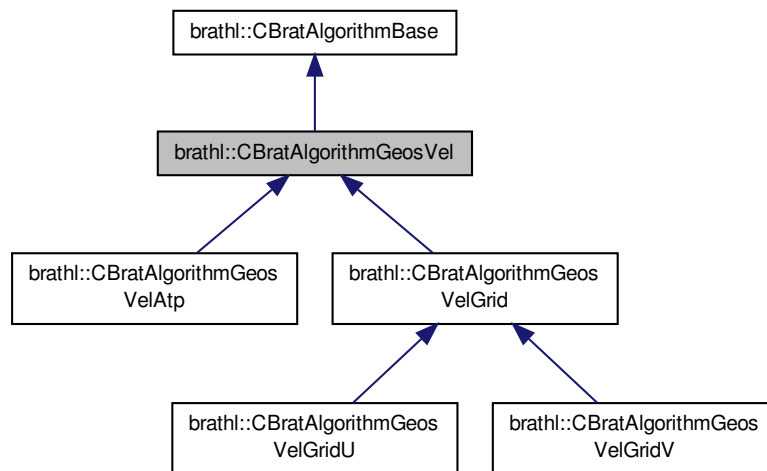
The documentation for this class was generated from the following files:

- BratAlgorithmBase.h
- BratAlgorithmBase.cpp

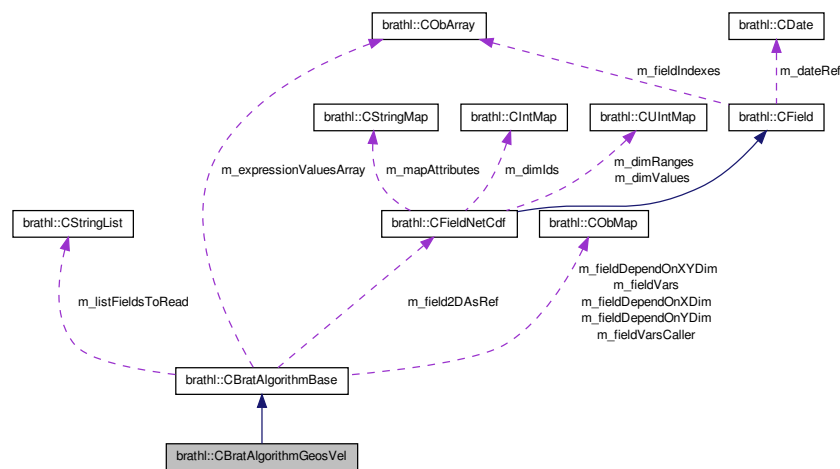
## 8.14 bratl::CBratAlgorithmGeosVel Class Reference

```
#include <BratAlgorithmGeosVel.h>
```

Inheritance diagram for bratl::CBratAlgorithmGeosVel:



Collaboration diagram for bratl::CBratAlgorithmGeosVel:



## Public Member Functions

- void **BtoE** (double lonPlane, double latPlane, double betaX, double betaY, double &lon, double &lat)
- **CBratAlgorithmGeosVel** ()
- **CBratAlgorithmGeosVel** (const **CBratAlgorithmGeosVel** &copy)
- virtual void **Dump** (std::ostream &fOut=std::cerr)
- void **EtoB** (double lonPlane, double latPlane, double lon, double lat, double &betaX, double &betaY)
- **CBratAlgorithmGeosVel** &operator= (const **CBratAlgorithmGeosVel** &copy)
- virtual ~**CBratAlgorithmGeosVel** ()



## Protected Member Functions

- virtual void **ComputeCoriolis** ()
- void **Init** ()
- void **Set** (const **CBratAlgorithmGeosVel** &o)
- void **SetBeginOfFile** ()
- void **SetEndOfFile** ()
- virtual void **SetNextValues** ()
- virtual void **SetPreviousValues** (bool fromProduct)

## Protected Attributes

- double **m\_beta**
- double **m\_coriolis**
- double **m\_degreeToRadianMultiplier**
- double **m\_earthRadius**
- bool **m\_equatorTransition**
- bool **m\_equatorTransitionIsNext**
- double **m\_gravity**
- double **m\_lat**
- CDoubleArray \* **m\_latArray**
- double **m\_latNext**
- double **m\_latPrev**
- double **m\_lon**
- CDoubleArray \* **m\_lonArray**
- double **m\_lonNext**
- double **m\_lonPrev**
- double **m\_omega**
- double **m\_p2**
- double **m\_velocity**

## Static Protected Attributes

- static const std::string **m\_LAT\_PARAM\_NAME** = "%{lat}"
- static const std::string **m\_LON\_PARAM\_NAME** = "%{lon}"

## Additional Inherited Members

## 8.14.1 Detailed Description

Algorithm base class.

## 8.14.2 Constructor &amp; Destructor Documentation

## 8.14.2.1 bratl::CBratAlgorithmGeosVel::CBratAlgorithmGeosVel ( )

Default constructor

8.14.2.2 bratl::CBratAlgorithmGeosVel::CBratAlgorithmGeosVel ( const **CBratAlgorithmGeosVel** & copy )

Copy constructor

## 8.14.2.3 bratl::CBratAlgorithmGeosVel::~CBratAlgorithmGeosVel ( ) [virtual]

Destructor

## 8.14.3 Member Function Documentation

## 8.14.3.1 void bratl::CBratAlgorithmGeosVel::Dump ( std::ostream &amp; fOut = std::cerr ) [virtual]

Dump function

Reimplemented from **bratl::CBratAlgorithmBase** (p. 123).

Reimplemented in **bratl::CBratAlgorithmGeosVelGridV** (p. 14), **bratl::CBratAlgorithmGeosVelGridU** (p. 14), **bratl::CBratAlgorithmGeosVelGrid** (p. 14), and **bratl::CBratAlgorithmGeosVelAtp** (p. 130).

References bratl::CBratAlgorithmBase::Dump().

Referenced by bratl::CBratAlgorithmGeosVelAtp::Dump(), and bratl::CBratAlgorithmGeosVelGrid::Dump().

## 8.14.3.2 CBratAlgorithmGeosVel &amp; bratl::CBratAlgorithmGeosVel::operator= ( const CBratAlgorithmGeosVel &amp; copy )

Overloads operator '='

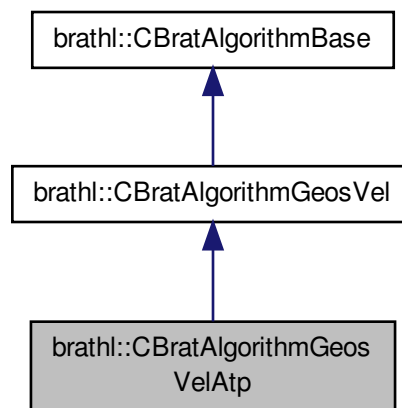
The documentation for this class was generated from the following files:

- BratAlgorithmGeosVel.h
- BratAlgorithmGeosVel.cpp

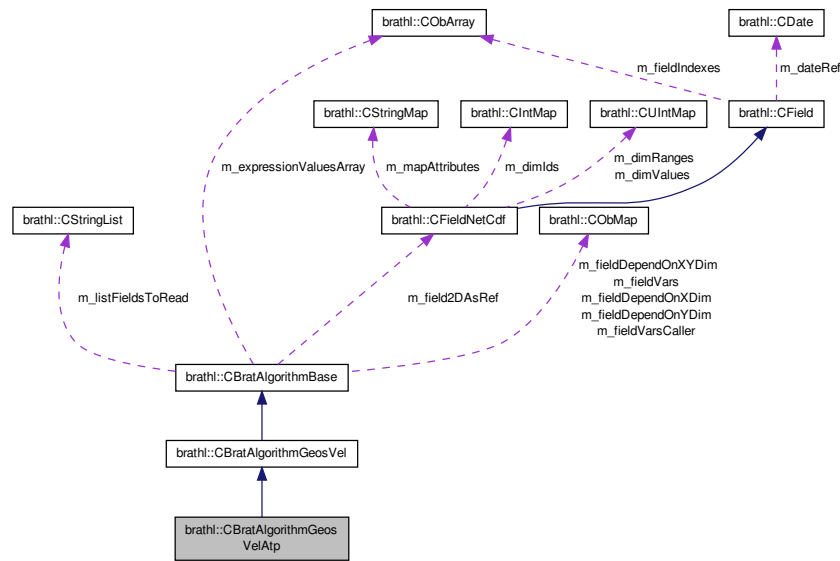
## 8.15 bratl::CBratAlgorithmGeosVelAtp Class Reference

```
#include <BratAlgorithmGeosVelAtp.h>
```

Inheritance diagram for bratl::CBratAlgorithmGeosVelAtp:



Collaboration diagram for brathl::CBratAlgorithmGeosVelAtp:



## Public Member Functions

- **CBratAlgorithmGeosVelAtp** ()
- **CBratAlgorithmGeosVelAtp** (const **CBratAlgorithmGeosVelAtp** &copy)
- virtual void **CheckInputParams** (CVectorBratAlgorithmParam &args) override
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetInputParamDesc** (uint32\_t indexParam) const override
- virtual  
CBratAlgorithmParam::bratAlgoParamTypeVal **GetInputParamFormat** (uint32\_t indexParam) const override
- virtual std::string **GetInputParamUnit** (uint32\_t indexParam) const override
- virtual std::string **GetName** () const override
- virtual uint32\_t **GetNumInputParam** () const override
- virtual std::string **GetOutputUnit** () const override
- virtual std::string **GetParamName** (uint32\_t indexParam) const override
- double **GetTrackDirection** ()
- **CBratAlgorithmGeosVelAtp** & **operator=** (const **CBratAlgorithmGeosVelAtp** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual void **SetParamValues** (CVectorBratAlgorithmParam &args)
- virtual ~**CBratAlgorithmGeosVelAtp** ()

## Protected Member Functions

- double **ComputeVelocity** ()
- double **ComputeVelocityEquator** ()
- double **ComputeVelocityOutsideEquator** ()
- void **Init** ()
- void **Set** (const **CBratAlgorithmGeosVelAtp** &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override
- void **SetEquatorTransition** ()

- void **SetGap** ()
- virtual void **SetNextValues** () override
- virtual void **SetPreviousValues** (bool fromProduct) override

#### Protected Attributes

- double **m\_gap**
- double **m\_varValue**
- double **m\_varValueNext**
- double **m\_varValuePrev**

#### Static Protected Attributes

- static const uint32\_t **m\_INPUT\_PARAMS** = 3
- static const uint32\_t **m\_LAT\_PARAM\_INDEX** = 0
- static const uint32\_t **m\_LON\_PARAM\_INDEX** = 1
- static const uint32\_t **m\_VAR\_PARAM\_INDEX** = 2

#### Additional Inherited Members

##### 8.15.1 Detailed Description

Algorithm base class.

##### 8.15.2 Constructor & Destructor Documentation

###### 8.15.2.1 bratl::CBratAlgorithmGeosVelAtp::CBratAlgorithmGeosVelAtp ( )

Default constructor

###### 8.15.2.2 bratl::CBratAlgorithmGeosVelAtp::CBratAlgorithmGeosVelAtp ( const CBratAlgorithmGeosVelAtp & copy )

Copy constructor

###### 8.15.2.3 virtual bratl::CBratAlgorithmGeosVelAtp::~~CBratAlgorithmGeosVelAtp ( ) [inline], [virtual]

Destructor

##### 8.15.3 Member Function Documentation

###### 8.15.3.1 void bratl::CBratAlgorithmGeosVelAtp::Dump ( std::ostream & fOut = std::cerr ) [override], [virtual]

Dump function

Reimplemented from **bratl::CBratAlgorithmGeosVel** (p. 128).

References **bratl::CBratAlgorithmGeosVel::Dump()**.

###### 8.15.3.2 virtual std::string bratl::CBratAlgorithmGeosVelAtp::GetDescription ( ) const [inline], [override], [virtual]

Gets the description of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

8.15.3.3 `virtual std::string bratl::CBratAlgorithmGeosVelAtp::GetInputParamDesc ( uint32_t indexParam ) const` `[inline]`, `[override]`, `[virtual]`

Gets the description of an input parameter.

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **bratl::CBratAlgorithmBase** (p. 124).

References `bratl::CTools::Format()`.

8.15.3.4 `virtual CBratAlgorithmParam::bratAlgoParamTypeVal bratl::CBratAlgorithmGeosVelAtp::GetInputParamFormat ( uint32_t indexParam ) const` `[inline]`, `[override]`, `[virtual]`

Gets the format of an input parameter : `CBratAlgorithmParam::T_DOUBLE` for double `CBratAlgorithmParam::T_FLOAT` for float `CBratAlgorithmParam::T_INT` for integer `CBratAlgorithmParam::T_LONG` for long integer `CBratAlgorithmParam::T_STRING` for `std::string` `CBratAlgorithmParam::T_CHAR` for a character

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **bratl::CBratAlgorithmBase** (p. 124).

References `bratl::CTools::Format()`.

8.15.3.5 `virtual std::string bratl::CBratAlgorithmGeosVelAtp::GetInputParamUnit ( uint32_t indexParam ) const` `[inline]`, `[override]`, `[virtual]`

Gets the unit of an input parameter :

#### Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **bratl::CBratAlgorithmBase** (p. 124).

References `bratl::CTools::Format()`.

8.15.3.6 `virtual std::string bratl::CBratAlgorithmGeosVelAtp::GetName ( ) const` `[inline]`, `[override]`, `[virtual]`

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

8.15.3.7 `virtual uint32_t bratl::CBratAlgorithmGeosVelAtp::GetNumInputParam ( ) const` `[inline]`, `[override]`, `[virtual]`

Gets the number of input parameters to pass to the 'Run' function

Implements **bratl::CBratAlgorithmBase** (p. 125).

8.15.3.8 `virtual std::string bratl::CBratAlgorithmGeosVelAtp::GetOutputUnit ( ) const` `[inline]`, `[override]`, `[virtual]`

Gets the unit of an output value returned by the 'Run' function.

#### Parameters

<i>indexParam</i>	[in] : parameter index.
-------------------	-------------------------

Implements **bratl::CBratAlgorithmBase** (p. 125).

### 8.15.3.9 CBratAlgorithmGeosVelAtp & bratl::CBratAlgorithmGeosVelAtp::operator= ( const CBratAlgorithmGeosVelAtp & copy )

Overloads operator '='

### 8.15.3.10 double bratl::CBratAlgorithmGeosVelAtp::Run ( CVectorBratAlgorithmParam & args ) [override], [virtual]

Runs the algorithm

#### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

#### Returns

the result of the execution

Implements **bratl::CBratAlgorithmBase** (p. 125).

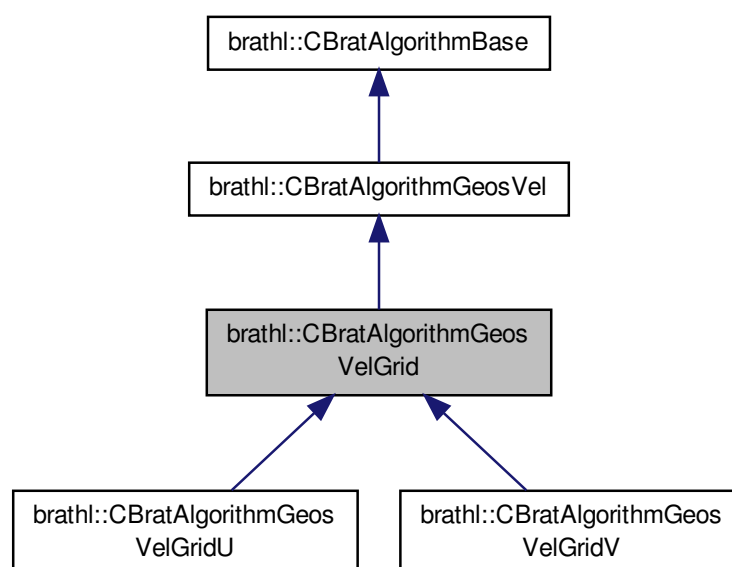
The documentation for this class was generated from the following files:

- BratAlgorithmGeosVelAtp.h
- BratAlgorithmGeosVelAtp.cpp

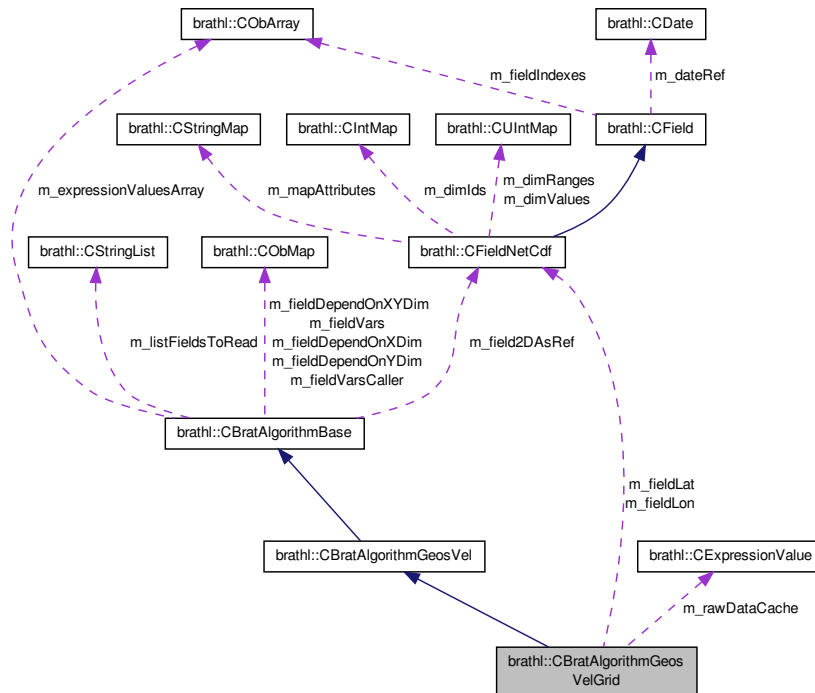
## 8.16 bratl::CBratAlgorithmGeosVelGrid Class Reference

```
#include <BratAlgorithmGeosVelGrid.h>
```

Inheritance diagram for bratl::CBratAlgorithmGeosVelGrid:



Collaboration diagram for brathl::CBratAlgorithmGeosVelGrid:



## Public Member Functions

- **CBratAlgorithmGeosVelGrid** ()
- **CBratAlgorithmGeosVelGrid** (const **CBratAlgorithmGeosVelGrid** &copy)
- virtual void **CheckInputParams** (CVectorBratAlgorithmParam &args) override
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual std::string **GetInputParamDesc** (uint32\_t indexParam) const override
- virtual  
CBratAlgorithmParam::bratAlgoParamTypeVal **GetInputParamFormat** (uint32\_t indexParam) const override
- virtual std::string **GetInputParamUnit** (uint32\_t indexParam) const override
- virtual uint32\_t **GetNumInputParam** () const override
- virtual std::string **GetOutputUnit** () const override
- virtual double **GetParamDefaultValue** (uint32\_t indexParam)
- virtual std::string **GetParamName** (uint32\_t indexParam) const override
- **CBratAlgorithmGeosVelGrid** & **operator=** (const **CBratAlgorithmGeosVelGrid** &copy)
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual void **SetParamValues** (CVectorBratAlgorithmParam &args)
- virtual ~**CBratAlgorithmGeosVelGrid** ()

## Protected Member Functions

- void **CheckEquatorLimit** ()
- void **CheckLatLonExpression** (uint32\_t index)
- void **CheckProduct** ()
- void **CheckVarExpression** (uint32\_t index)
- double **ComputeMean** ()

- double **ComputeSingle** ()
- virtual double **ComputeVelocity** ()=0
- virtual void **DeleteFieldNetCdf** () override
- virtual void **DeleteProduct** () override
- uint32\_t **GetLatDimRange** (CFieldNetCdf \*field)
- int32\_t **GetLatitudeIndex** (double value)
- void **GetLatitudes** ()
- uint32\_t **GetLonDimRange** (CFieldNetCdf \*field)
- int32\_t **GetLongitudeIndex** (double value)
- void **GetLongitudes** ()
- void **GetVarCacheExpressionValue** (int32\_t minIndexLat, int32\_t maxIndexLat, int32\_t minIndexLon, int32\_t maxIndexLon)
- double **GetVarExpressionValue** (int32\_t indexLat, int32\_t indexLon)
- double **GetVarExpressionValueCache** (int32\_t indexLat, int32\_t indexLon)
- void **Init** ()
- virtual void **OpenProductFile** () override
- bool **PrepareComputeVelocity** ()
- virtual void **PrepareDataReading2D** (int32\_t minIndexLat, int32\_t maxIndexLat, int32\_t minIndexLon, int32\_t maxIndexLon)
- virtual void **PrepareDataReading2D** (int32\_t indexLat, int32\_t indexLon)
- virtual void **PrepareDataValues2DComplexExpression** (CExpressionValue &exprValue)
- virtual void **PrepareDataValues2DComplexExpressionWithAlgo** (CExpressionValue &exprValue)
- virtual void **PrepareDataValues2DOneField** (CExpressionValue &exprValue)
- void **Set** (const CBratAlgorithmGeosVelGrid &copy)
- virtual void **SetBeginOfFile** () override
- virtual void **SetEndOfFile** () override

#### Protected Attributes

- bool **m\_allLongitudes**
- double **m\_equatorLimit**
- CFieldNetCdf \* **m\_fieldLat**
- CFieldNetCdf \* **m\_fieldLon**
- int32\_t **m\_indexLat**
- int32\_t **m\_indexLon**
- CDoubleArray **m\_latitudes**
- CDoubleArray **m\_longitudes**
- double **m\_lonMax**
- double **m\_lonMin**
- CExpressionValue **m\_rawDataCache**
- int32\_t **m\_varDimLatIndex**
- int32\_t **m\_varDimLonIndex**
- double **m\_varValue**
- double **m\_varValueE**
- double **m\_varValueN**
- double **m\_varValueS**
- double **m\_varValueW**

#### Static Protected Attributes

- static const uint32\_t **m\_EQUATOR\_LAT\_LIMIT\_INDEX** = 3
- static const uint32\_t **m\_INPUT\_PARAMS** = 4
- static const uint32\_t **m\_LAT\_PARAM\_INDEX** = 0
- static const uint32\_t **m\_LON\_PARAM\_INDEX** = 1
- static const uint32\_t **m\_VAR\_PARAM\_INDEX** = 2



## Additional Inherited Members

## 8.16.1 Detailed Description

Algorithm base class.

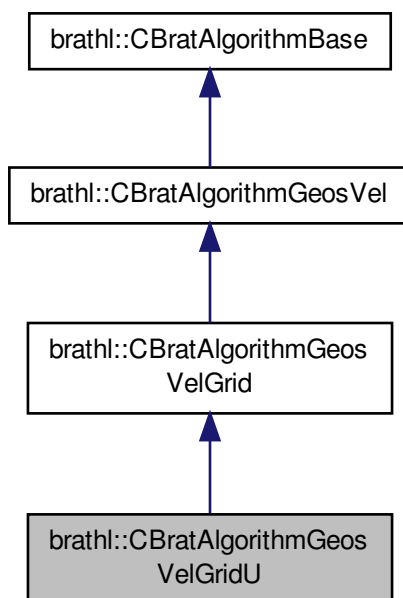
The documentation for this class was generated from the following files:

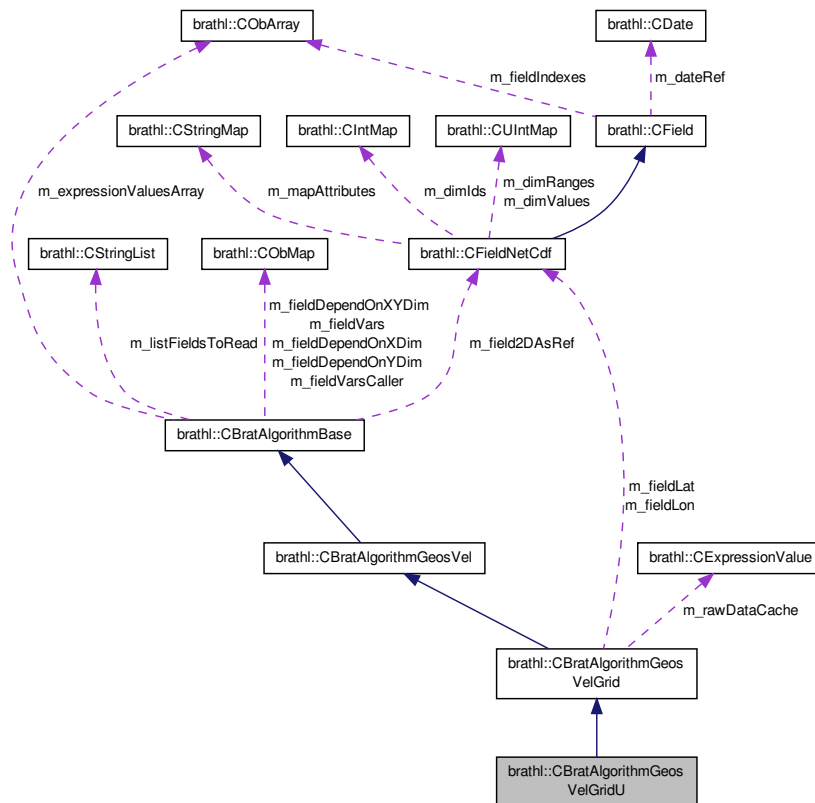
- BratAlgorithmGeosVelGrid.h
- BratAlgorithmGeosVelGrid.cpp

## 8.17 bratl::CBratAlgorithmGeosVelGridU Class Reference

```
#include <BratAlgorithmGeosVelGrid.h>
```

Inheritance diagram for bratl::CBratAlgorithmGeosVelGridU:





- **CBratAlgorithmGeosVelGridU** ()
- **CBratAlgorithmGeosVelGridU** (const **CBratAlgorithmGeosVelGridU** &copy)
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetName** () const override
- virtual ~**CBratAlgorithmGeosVelGridU** ()

- double **ComputeVelocity** () override
- void **Init** ()

### 8.17.1 Detailed Description

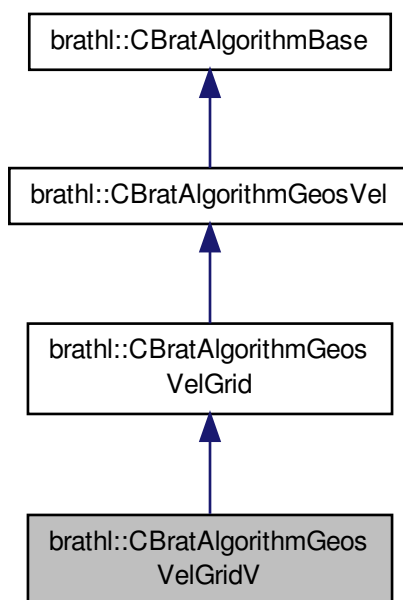
The documentation for this class was generated from the following files:

- BratAlgorithmGeosVelGrid.h
- BratAlgorithmGeosVelGrid.cpp

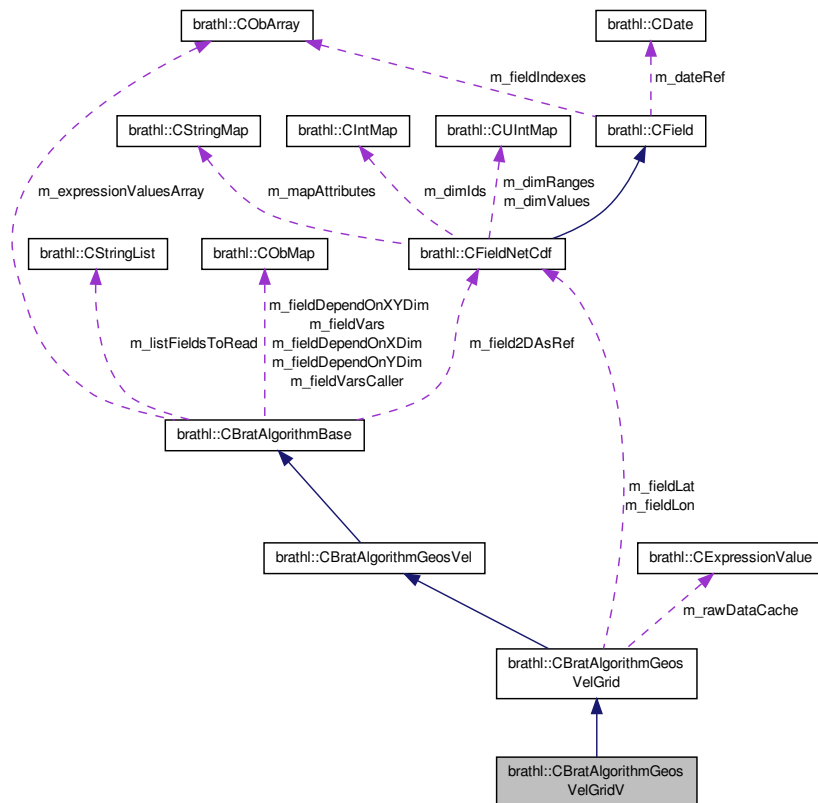
## 8.18 bratl::CBratAlgorithmGeosVelGridV Class Reference

```
#include <BratAlgorithmGeosVelGrid.h>
```

Inheritance diagram for bratl::CBratAlgorithmGeosVelGridV:



Collaboration diagram for bratl::CBratAlgorithmGeosVelGridV:



### Public Member Functions

- **CBratAlgorithmGeosVelGridV** ()
- **CBratAlgorithmGeosVelGridV** (const **CBratAlgorithmGeosVelGridV** &copy)
- virtual void **Dump** (std::ostream &fOut=std::cerr) override
- virtual std::string **GetDescription** () const override
- virtual std::string **GetName** () const override
- virtual ~**CBratAlgorithmGeosVelGridV** ()

### Protected Member Functions

- double **ComputeVelocity** () override
- void **Init** ()

### Additional Inherited Members

#### 8.18.1 Detailed Description

Algorithm base class.

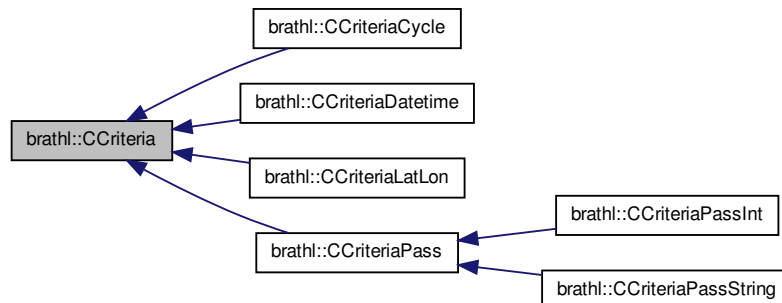
The documentation for this class was generated from the following files:

- BratAlgorithmGeosVelGrid.h
- BratAlgorithmGeosVelGrid.cpp

## 8.19 bratl::CCriteria Class Reference

```
#include <Criteria.h>
```

Inheritance diagram for bratl::CCriteria:



### Public Types

- enum **CriteriaKind** {  
**UNKNOWN, LATLON, DATETIME, PASS,**  
**CYCLE** }

### Public Member Functions

- **CCriteria** ()  
*Empty CCriteria (p. 139) ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- virtual std::string **GetAsText** (const std::string &delimiter)=0
- int32\_t **GetKey** ()
- virtual bool **IsDefaultValue** ()=0
- virtual void **SetDefaultValue** ()=0
- virtual ~**CCriteria** ()  
*Destructor.*

### Static Public Member Functions

- static void **Adjust** (CIntArray &array)
- static **CCriteria** \* **GetCriteria** (CBratObject \*ob, bool withExcept=true)

### Protected Attributes

- int32\_t **m\_key**

#### 8.19.1 Detailed Description

Criteria management class.

Version

1.0

## 8.19.2 Member Enumeration Documentation

### 8.19.2.1 enum brathl::CCriteria::CriteriaKind

Kind of criteria enumeration.

Enumerator:

**UNKNOWN** not set  
**LATLON** geographical latitude/longitude area  
**DATETIME** date/time  
**PASS** Pass  
**CYCLE** Cycle

## 8.19.3 Member Function Documentation

### 8.19.3.1 virtual bool brathl::CCriteria::IsDefaultValue ( ) [pure virtual]

Tests whether value have been initialized or not

Returns

true if not initialized

Implemented in **brathl::CCriteriaPassInt** (p. 60), **brathl::CCriteriaLatLon** (p. 159), **brathl::CCriteriaDatetime** (p. 150), **brathl::CCriteriaCycle** (p. 144), **brathl::CCriteriaPassString** (p. 60), and **brathl::CCriteriaPass** (p. 59).

### 8.19.3.2 virtual void brathl::CCriteria::SetDefaultValue ( ) [pure virtual]

Sets internal value to the default value (uninitialized)

Implemented in **brathl::CCriteriaPassInt** (p. 61), **brathl::CCriteriaLatLon** (p. 160), **brathl::CCriteriaDatetime** (p. 151), **brathl::CCriteriaCycle** (p. 144), **brathl::CCriteriaPassString** (p. 61), and **brathl::CCriteriaPass** (p. 61).

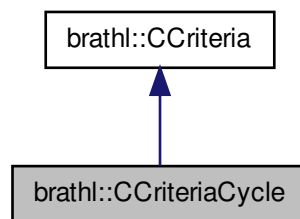
The documentation for this class was generated from the following files:

- Criteria.h
- Criteria.cpp

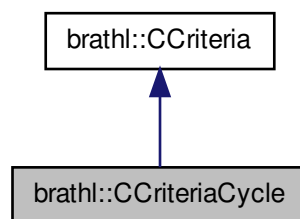
## 8.20 brathl::CCriteriaCycle Class Reference

```
#include <CriteriaCycle.h>
```

Inheritance diagram for brathl::CCriteriaCycle:



Collaboration diagram for brathl::CCriteriaCycle:



#### Public Member Functions

- **CCriteriaCycle** ()  
*Empty CCriteriaCycle (p. 140) ctor.*
- **CCriteriaCycle** (CCriteriaCycle &c)
- **CCriteriaCycle** (CCriteriaCycle \*c)
- **CCriteriaCycle** (int32\_t from, int32\_t to)
- **CCriteriaCycle** (const std::string &from, const std::string &to)
- **CCriteriaCycle** (const CStringArray &array)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- std::string **GetAsText** (const std::string &delimiter=CCriteriaCycle::m\_delimiter)
- int32\_t **GetFrom** ()
- int32\_t **GetTo** ()
- bool **Intersect** (CStringArray &array, CStringArray &intersect)
- bool **Intersect** (CStringArray &array, CIntArray &intersect)
- bool **Intersect** (CIntArray &array, CStringArray &intersect)
- bool **Intersect** (CIntArray &array, CIntArray &intersect)
- bool **Intersect** (int32\_t from, int32\_t to, CStringArray &intersect)
- bool **Intersect** (int32\_t from, int32\_t to, CIntArray &intersect)
- bool **Intersect** (const std::string &from, const std::string &to, CIntArray &intersect)

- bool **Intersect** (double otherFrom, double otherTo, CIntArray &intersect)
- bool **Intersect** (const std::string &from, const std::string &to, CStringArray &intersect)
- bool **IsDefaultValue** ()
- const **CCriteriaCycle** & **operator=** (**CCriteriaCycle** &c)
- void **Set** (**CCriteriaCycle** &c)
- void **Set** (int32\_t from, int32\_t to)
- void **Set** (const std::string &from, const std::string &to)
- void **Set** (const CStringArray &array)
- void **SetDefaultValue** ()
- void **SetFrom** (int32\_t from)
- void **SetFrom** (const std::string &from)
- void **SetFromText** (const std::string &values, const std::string &delimiter=CCriteriaCycle::m\_delimiter)
- void **SetTo** (int32\_t to)
- void **SetTo** (const std::string &to)
- virtual ~**CCriteriaCycle** ()

*Destructor.*

#### Static Public Member Functions

- static **CCriteriaCycle** \* **GetCriteria** (CBratObject \*ob, bool withExcept=true)

#### Static Public Attributes

- static const std::string **m\_delimiter** = " "

#### Protected Member Functions

- void **Adjust** ()
- void **Init** ()

#### Protected Attributes

- int32\_t **m\_from**
- int32\_t **m\_to**

#### Additional Inherited Members

##### 8.20.1 Detailed Description

Pass number (from/to) Criteria management class.

#### Version

1.0

##### 8.20.2 Constructor & Destructor Documentation

###### 8.20.2.1 brathl::CCriteriaCycle::CCriteriaCycle ( int32\_t from, int32\_t to )

Constructor.

#### Parameters

<i>from</i>	start pass
<i>to</i>	end pass



8.20.2.2 bratl::CCriteriaCycle::CCriteriaCycle ( const std::string & *from*, const std::string & *to* )

Constructor.

## Parameters

<i>from</i>	start pass
<i>to</i>	end pass

8.20.2.3 bratl::CCriteriaCycle::CCriteriaCycle ( const CStringArray & *array* )

Constructor from a array that contains start pass as std::string, end pass as std::string

## Parameters

<i>array</i>	start and end dates
--------------	---------------------

## 8.20.3 Member Function Documentation

8.20.3.1 bool bratl::CCriteriaCycle::Intersect ( CStringArray & *array*, CStringArray & *intersect* )

Create the intersection of this date period with the given one

## Parameters

<i>array</i>	that contains start pass as std::string, end pass as std::string
<i>intersect</i>	intersection period

## Returns

true, or false if there is no intersection

8.20.3.2 bool bratl::CCriteriaCycle::Intersect ( CStringArray & *array*, CIntArray & *intersect* )

Create the intersection of this date period with the given one

## Parameters

<i>array</i>	that contains start pass as std::string, end pass as std::string
<i>intersect</i>	intersection period

## Returns

true, or false if there is no intersection

8.20.3.3 bool bratl::CCriteriaCycle::Intersect ( CIntArray & *array*, CStringArray & *intersect* )

Create the intersection of this date period with the given one

## Parameters

<i>array</i>	that contains start pass as std::string, end pass as std::string
<i>intersect</i>	intersection period

## Returns

true, or false if there is no intersection

8.20.3.4 bool brathl::CCriteriaCycle::Intersect ( CIntArray & *array*, CIntArray & *intersect* )

Create the intersection of this date period with the given one

## Parameters

<i>array</i>	that contains start pass as std::string, end pass as std::string
<i>intersect</i>	intersection period

## Returns

true, or false if there is no intersection

## 8.20.3.5 bool brathl::CCriteriaCycle::IsDefaultValue ( ) [virtual]

Tests whether the pass have been initialized or not

## Returns

true if not initialized

Implements **brathl::CCriteria** (p. 140).

8.20.3.6 void brathl::CCriteriaCycle::Set ( int32\_t *from*, int32\_t *to* )

Sets date period from start and end pass

## Parameters

<i>from</i>	start pass
<i>to</i>	end pass

8.20.3.7 void brathl::CCriteriaCycle::Set ( const std::string & *from*, const std::string & *to* )

Sets date period from start and end pass

## Parameters

<i>from</i>	start pass
<i>to</i>	end pass

References brathl::CTools::StrToInt32().

8.20.3.8 void brathl::CCriteriaCycle::Set ( const CStringArray & *array* )

Sets a date period from a array that contains start pass as std::string, end pass as std::string

## Parameters

<i>array</i>	start and end dates
--------------	---------------------

## 8.20.3.9 void brathl::CCriteriaCycle::SetDefaultValue ( ) [virtual]

Sets internal value to the default value (uninitialized)

Implements **brathl::CCriteria** (p. 140).

8.20.3.10 void brathl::CCriteriaCycle::SetFrom ( int32\_t *from* )

Sets start pass

## Parameters

<i>to</i>	start pass
-----------	------------

8.20.3.11 void brathl::CCriteriaCycle::SetFrom ( const std::string & *from* )

Sets start pass

## Parameters

<i>to</i>	start pass
-----------	------------

References brathl::CTools::StrToInt32().

8.20.3.12 void brathl::CCriteriaCycle::SetTo ( int32\_t *to* )

Sets end pass

## Parameters

<i>to</i>	end pass
-----------	----------

8.20.3.13 void brathl::CCriteriaCycle::SetTo ( const std::string & *to* )

Sets end pass

## Parameters

<i>to</i>	end pass
-----------	----------

References brathl::CTools::StrToInt32().

## 8.20.4 Member Data Documentation

## 8.20.4.1 int32\_t brathl::CCriteriaCycle::m\_from [protected]

start pass

## 8.20.4.2 int32\_t brathl::CCriteriaCycle::m\_to [protected]

end pass

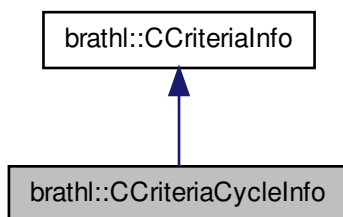
The documentation for this class was generated from the following files:

- CriteriaCycle.h
- CriteriaCycle.cpp

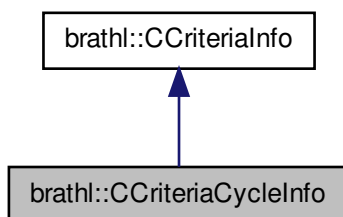
## 8.21 brathl::CCriteriaCycleInfo Class Reference

```
#include <CriteriaInfo.h>
```

Inheritance diagram for bratl::CCriteriaCycleInfo:



Collaboration diagram for bratl::CCriteriaCycleInfo:



#### Public Member Functions

- **CCriteriaCycleInfo** ()  
*Empty CCriteriaCycleInfo (p. 145) ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- CFieldInfo \* **GetEndCycleField** ()
- const std::string & **GetEndCycleFieldName** ()
- virtual void **GetFieldsInfo** (CObMap \*fieldsInfo)
- CFieldInfo \* **GetStartCycleField** ()
- const std::string **GetStartCycleFieldName** ()
- void **SetEndCycleField** (const std::string &value)
- void **SetEndCycleField** (CFieldInfo &value)
- void **SetStartCycleField** (const std::string &value)
- void **SetStartCycleField** (CFieldInfo &value)
- virtual ~**CCriteriaCycleInfo** ()  
*Destructor.*

#### Static Public Member Functions

- static **CCriteriaCycleInfo** \* **GetCriteriaInfo** (CBratObject \*ob, bool withExcept=true)

## Protected Attributes

- CFieldInfo **m\_endCycleField**
- CFieldInfo **m\_startCycleField**

## 8.21.1 Detailed Description

Cycle criteria information management class.

## Version

1.0

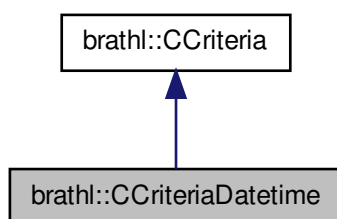
The documentation for this class was generated from the following files:

- CriterialInfo.h
- CriterialInfo.cpp

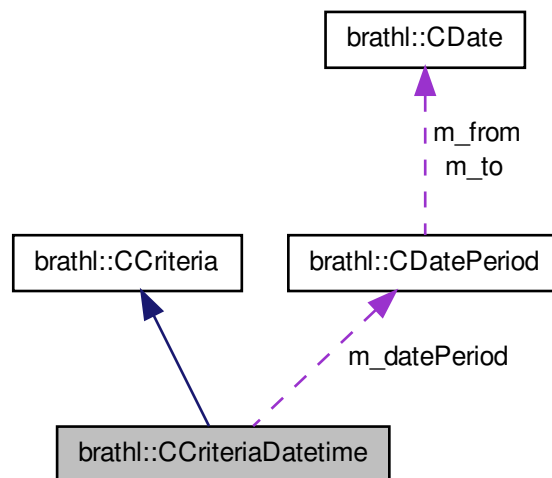
## 8.22 brathl::CCriteriaDatetime Class Reference

```
#include <CriteriaDatetime.h>
```

Inheritance diagram for brathl::CCriteriaDatetime:



Collaboration diagram for brathl::CCriteriaDatetime:



#### Public Member Functions

- **CCriteriaDatetime** ()  
*Empty CCriteriaDatetime (p. 147) ctor.*
- **CCriteriaDatetime** (CCriteriaDatetime &c)
- **CCriteriaDatetime** (CCriteriaDatetime \*c)
- **CCriteriaDatetime** (CDatePeriod &datePeriod)
- **CCriteriaDatetime** (CDate &from, CDate &to)
- **CCriteriaDatetime** (const std::string &from, const std::string &to)
- **CCriteriaDatetime** (double from, double to)
- **CCriteriaDatetime** (const CStringArray &array)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- std::string **GetAsText** (const std::string &delimiter=CDatePeriod::m\_delimiter)
- CDatePeriod \* **GetDatePeriod** ()
- CDate \* **GetFrom** ()
- std::string **GetFromAsText** ()
- CDate \* **GetTo** ()
- std::string **GetToAsText** ()
- bool **Intersect** (CDatePeriod &datePeriod, CDatePeriod &intersect)
- bool **Intersect** (double otherFrom, double otherTo, CDatePeriod &intersect)
- bool **Intersect** (double otherFrom, double otherTo)
- bool **IsDefaultValue** ()
- const CCriteriaDatetime & **operator=** (CCriteriaDatetime &c)
- void **Set** (CDatePeriod &datePeriod)
- void **Set** (CDate &from, CDate &to)
- void **Set** (const std::string &from, const std::string &to)
- void **Set** (double from, double to)
- void **Set** (const CStringArray &array)
- void **Set** (CCriteriaDatetime &c)

- void **SetDefaultValue** ()
- void **SetFrom** (CDate &from)
- void **SetFrom** (const std::string &strDate)
- void **SetFromText** (const std::string &values, const std::string &delimiter=CDatePeriod::m\_delimiter)
- void **SetTo** (CDate &to)
- void **SetTo** (const std::string &strDate)
- virtual **~CCriteriaDatetime** ()

*Destructor.*

#### Static Public Member Functions

- static **CCriteriaDatetime** \* **GetCriteria** (CBratObject \*ob, bool withExcept=true)

#### Protected Member Functions

- void **Init** ()

#### Protected Attributes

- **CDatePeriod** m\_datePeriod

#### Additional Inherited Members

### 8.22.1 Detailed Description

Datetime Criteria management class.

#### Version

1.0

### 8.22.2 Constructor & Destructor Documentation

#### 8.22.2.1 bratl::CCriteriaDatetime::CCriteriaDatetime ( CDatePeriod & datePeriod )

Constructor.

##### Parameters

<i>datePeriod</i>	period to set
-------------------	---------------

#### 8.22.2.2 bratl::CCriteriaDatetime::CCriteriaDatetime ( CDate & from, CDate & to )

Constructor.

##### Parameters

<i>from</i>	start date
<i>to</i>	end date

#### 8.22.2.3 bratl::CCriteriaDatetime::CCriteriaDatetime ( const std::string & from, const std::string & to )

Constructor.

## Parameters

<i>from</i>	start date
<i>to</i>	end date

8.22.2.4 brathl::CCriteriaDatetime::CCriteriaDatetime ( double *from*, double *to* )

Constructor.

## Parameters

<i>from</i>	start date (number of seconds since 1950-01-01)
<i>to</i>	end date (number of seconds since 1950-01-01)

8.22.2.5 brathl::CCriteriaDatetime::CCriteriaDatetime ( const CStringArray & *array* )

Constructor from a array that contains start date as std::string, end date as std::string

## Parameters

<i>array</i>	start and end dates
--------------	---------------------

## 8.22.3 Member Function Documentation

8.22.3.1 bool brathl::CCriteriaDatetime::Intersect ( CDatePeriod & *datePeriod*, CDatePeriod & *intersect* )

Create the intersection of this date period with the given one

## Parameters

<i>datePeriod</i>	intersect with this
<i>intersect</i>	intersection period

## Returns

true, or false if there is no intersection

8.22.3.2 bool brathl::CCriteriaDatetime::Intersect ( double *otherFrom*, double *otherTo*, CDatePeriod & *intersect* )

Create the intersection of this date period with the given one

## Parameters

<i>otherFrom</i>	start date intersect with this
<i>otherTo</i>	end date intersect with this
<i>intersect</i>	intersection period

## Returns

true, or false if there is no intersection

## 8.22.3.3 bool brathl::CCriteriaDatetime::IsDefaultValue ( ) [virtual]

Tests whether date period have been initialized or not



## Returns

true if not initialized

Implements **bratl::CCriteria** (p. 140).

8.22.3.4 void bratl::CCriteriaDatetime::Set ( CDatePeriod & *datePeriod* )

Sets date period from another one

## Parameters

<i>datePeriod</i>	period to set
-------------------	---------------

8.22.3.5 void bratl::CCriteriaDatetime::Set ( CDate & *from*, CDate & *to* )

Sets date period from start and end date

## Parameters

<i>from</i>	start date
<i>to</i>	end date

8.22.3.6 void bratl::CCriteriaDatetime::Set ( const std::string & *from*, const std::string & *to* )

Sets date period from start and end date

## Parameters

<i>from</i>	start date
<i>to</i>	end date

8.22.3.7 void bratl::CCriteriaDatetime::Set ( const CStringArray & *array* )

Sets a date period from a array that contains start date as std::string, end date as std::string

## Parameters

<i>array</i>	start and end dates
--------------	---------------------

## 8.22.3.8 void bratl::CCriteriaDatetime::SetDefaultValue ( ) [virtual]

Sets internal value to the default value (uninitialized)

Implements **bratl::CCriteria** (p. 140).

8.22.3.9 void bratl::CCriteriaDatetime::SetFrom ( CDate & *from* )

Sets start date

## Parameters

<i>to</i>	start date
-----------	------------

8.22.3.10 void bratl::CCriteriaDatetime::SetFrom ( const std::string & *strDate* )

Sets start date

## Parameters

<i>to</i>	start date
-----------	------------

8.22.3.11 void brathl::CCriteriaDatetime::SetTo ( CDate & *to* )

Sets end date

## Parameters

<i>to</i>	end date
-----------	----------

8.22.3.12 void brathl::CCriteriaDatetime::SetTo ( const std::string & *strDate* )

Sets end date

## Parameters

<i>to</i>	end date
-----------	----------

## 8.22.4 Member Data Documentation

## 8.22.4.1 CDatePeriod brathl::CCriteriaDatetime::m\_datePeriod [protected]

Date period

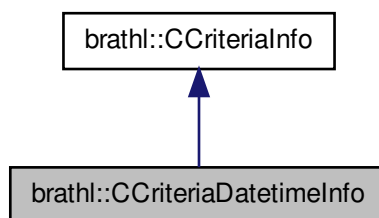
The documentation for this class was generated from the following files:

- CriteriaDatetime.h
- CriteriaDatetime.cpp

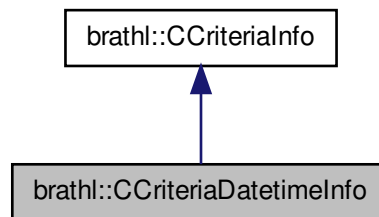
## 8.23 brathl::CCriteriaDatetimeInfo Class Reference

```
#include <CriteriaInfo.h>
```

Inheritance diagram for brathl::CCriteriaDatetimeInfo:



Collaboration diagram for brathl::CCriteriaDatetimedInfo:



#### Public Member Functions

- **CCriteriaDatetimedInfo ()**  
*Empty CCriteriaDatetimedInfo (p. 152) ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- CFieldInfo \* **GetEndDateField** ()
- const std::string & **GetEndDateFieldName** ()
- virtual void **GetFieldsInfo** (CObMap \*fieldsInfo)
- **brathl\_refDate** **GetRefDate** ()
- CFieldInfo \* **GetStartDateField** ()
- const std::string & **GetStartDateFieldName** ()
- void **SetEndDateField** (const std::string &value)
- void **SetEndDateField** (CFieldInfo &value)
- void **SetRefDate** (brathl\_refDate value)
- void **SetStartDateField** (const std::string &value)
- void **SetStartDateField** (CFieldInfo &value)
- virtual ~**CCriteriaDatetimedInfo** ()  
*Destructor.*

#### Static Public Member Functions

- static **CCriteriaDatetimedInfo** \* **GetCriterialInfo** (CBratObject \*ob, bool withExcept=true)

#### Protected Attributes

- CFieldInfo **m\_endDateField**
- **brathl\_refDate** **m\_refDate**
- CFieldInfo **m\_startDateField**

#### 8.23.1 Detailed Description

Date/Time criteria information management class.

## Version

1.0

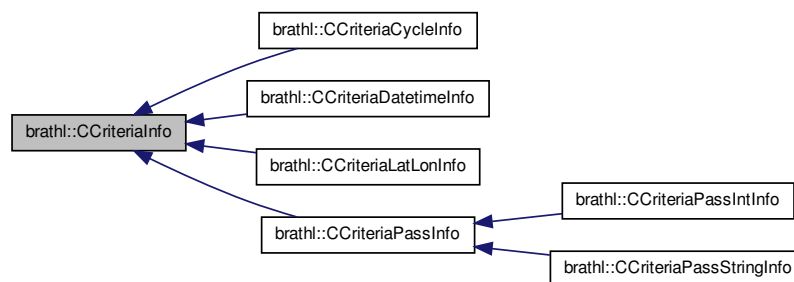
The documentation for this class was generated from the following files:

- CriterialInfo.h
- CriterialInfo.cpp

## 8.24 bratl::CCriterialInfo Class Reference

```
#include <CriteriaInfo.h>
```

Inheritance diagram for bratl::CCriterialInfo:



## Public Member Functions

- **CCriterialInfo** ()  
*Empty **CCriterialInfo** (p. 154) ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- std::string **GetDataRecord** ()
- virtual void **GetFieldNames** (CStringList &fieldNames)
- virtual void **GetFieldNames** (CStringArray &fieldNames)
- virtual void **GetFields** (CRecordDataMap &listRecord)
- virtual void **GetFieldsInfo** (CObMap \*fieldsInfo)=0
- int32\_t **GetKey** ()
- void **SetDataRecord** (const std::string &value)
- virtual ~**CCriterialInfo** ()  
*Destructor.*

## Static Public Member Functions

- static **CCriterialInfo** \* **GetCriterialInfo** (CBratObject \*ob, bool withExcept=true)

## Protected Attributes

- std::string **m\_dataRecord**
- int32\_t **m\_key**

### 8.24.1 Detailed Description

Base class for criteria information.

#### Version

1.0

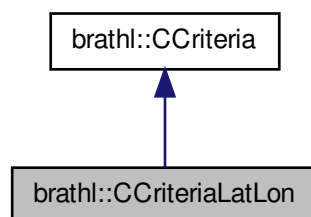
The documentation for this class was generated from the following files:

- CriterialInfo.h
- CriterialInfo.cpp

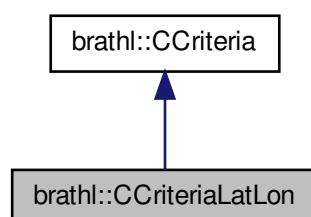
## 8.25 bratl::CCriteriaLatLon Class Reference

```
#include <CriteriaLatLon.h>
```

Inheritance diagram for bratl::CCriteriaLatLon:



Collaboration diagram for bratl::CCriteriaLatLon:



#### Public Member Functions

- **CCriteriaLatLon ()**  
*Empty CCriteriaLatLon (p. 155) ctor.*
- **CCriteriaLatLon (CCriteriaLatLon &c)**

- **CCriteriaLatLon** (**CCriteriaLatLon** \*c)
- **CCriteriaLatLon** (CLatLonRect &latLonRect)
- **CCriteriaLatLon** (CLatLonPoint &p1, double deltaLat, double deltaLon)
- **CCriteriaLatLon** (CLatLonPoint &latLonLow, CLatLonPoint &latLonHigh)
- **CCriteriaLatLon** (double latLow, double lonLow, double latHigh, double lonHigh)
- **CCriteriaLatLon** (const std::string &latLow, const std::string &lonLow, const std::string &latHigh, const std::string &lonHigh)
- **CCriteriaLatLon** (const CStringArray &array)
- virtual void **Dump** (std::ostream &fOut=std::cerr)

*Dump fonction.*

- virtual std::string **GetAsText** (const std::string &delimiter=CLatLonRect::m\_delimiter)
- CLatLonRect \* **GetLatLonRect** ()
- double **GetLowerLeftLat** ()
- double **GetLowerLeftLon** ()
- double **GetLowerRightLat** ()
- double **GetLowerRightLon** ()
- double **GetUpperLeftLat** ()
- double **GetUpperLeftLon** ()
- double **GetUpperRightLat** ()
- double **GetUpperRightLon** ()
- bool **Intersect** (CLatLonRect &clip, CLatLonRect &intersect)
- bool **IsDefaultValue** ()
- const **CCriteriaLatLon** & **operator=** (**CCriteriaLatLon** &c)
- void **Set** (CLatLonRect &latLonRect)
- void **Set** (CLatLonPoint &p1, double deltaLat, double deltaLon)
- void **Set** (CLatLonPoint &latLonLow, CLatLonPoint &latLonHigh)
- void **Set** (double latLow, double lonLow, double latHigh, double lonHigh)
- void **Set** (const std::string &latLow, const std::string &lonLow, const std::string &latHigh, const std::string &lonHigh)
- void **Set** (const std::string &latLonRect, const std::string &delimiter=CLatLonRect::m\_delimiter)
- void **Set** (**CCriteriaLatLon** &c)
- void **SetDefaultValue** ()
- virtual ~**CCriteriaLatLon** ()

*Destructor.*

#### Static Public Member Functions

- static **CCriteriaLatLon** \* **GetCriteria** (CBratObject \*ob, bool withExcept=true)
- static double **GetMinOrMaxLon** (double lon1, double lon2, bool wantMin)

#### Protected Member Functions

- void **Init** ()

#### Protected Attributes

- CLatLonRect **m\_latLonRect**

## Additional Inherited Members

## 8.25.1 Detailed Description

Latitude/Longitude Criteria management class.

## Version

1.0

## 8.25.2 Constructor &amp; Destructor Documentation

8.25.2.1 bratl::CCriteriaLatLon::CCriteriaLatLon ( CLatLonRect & *latLonRect* )

Constructor.

## Parameters

<i>latLonRect</i>	lat/lon bounding box
-------------------	----------------------

8.25.2.2 bratl::CCriteriaLatLon::CCriteriaLatLon ( CLatLonPoint & *p1*, double *deltaLat*, double *deltaLon* )

Construct a lat/lon bounding box from a point, and a delta lat, lon. This disambiguates which way the box wraps around the globe.

## Parameters

<i>p1</i>	one corner of the box
<i>deltaLat</i>	delta lat from p1. (may be positive or negative)
<i>deltaLon</i>	delta lon from p1. (may be positive or negative)

8.25.2.3 bratl::CCriteriaLatLon::CCriteriaLatLon ( CLatLonPoint & *latLonLow*, CLatLonPoint & *latLonHigh* )

Constructor.

## Parameters

<i>latLonLow</i>	lat/lon low point
<i>latLonHigh</i>	lat/lon high point

8.25.2.4 bratl::CCriteriaLatLon::CCriteriaLatLon ( double *latLow*, double *lonLow*, double *latHigh*, double *lonHigh* )

Constructor.

## Parameters

<i>latLow</i>	latitude low
<i>lonLow</i>	longitude low
<i>latHigh</i>	latitude high
<i>lonHigh</i>	longitude high

8.25.2.5 bratl::CCriteriaLatLon::CCriteriaLatLon ( const std::string & *latLow*, const std::string & *lonLow*, const std::string & *latHigh*, const std::string & *lonHigh* )

Constructor.

## Parameters

<i>latLow</i>	latitude low
<i>lonLow</i>	longitude low
<i>latHigh</i>	latitude high
<i>lonHigh</i>	longitude high

## 8.25.2.6 bratl::CCriteriaLatLon::CCriteriaLatLon ( const CStringArray &amp; array )

Constructor from a list that contains low latitude value, low longitude value, high latitude value, high longitude value.

## Parameters

<i>array</i>	to be converted
--------------	-----------------

## 8.25.2.7 bratl::CCriteriaLatLon::~~CCriteriaLatLon ( ) [virtual]

Destructor.

Getter of the property `latLonRect`;

## Returns

Returns the `latLonRect`.

## 8.25.3 Member Function Documentation

## 8.25.3.1 double bratl::CCriteriaLatLon::GetLowerLeftLat ( ) [inline]

## Returns

lower left latitude of the lat/lon box, `Double.MAX_VALUE` if not set.

## 8.25.3.2 double bratl::CCriteriaLatLon::GetLowerLeftLon ( ) [inline]

## Returns

lower left longitude of the lat/lon box, `Double.MAX_VALUE` if not set.

## 8.25.3.3 double bratl::CCriteriaLatLon::GetLowerRightLat ( ) [inline]

## Returns

lower right latitude of the lat/lon box, `Double.MAX_VALUE` if not set.

## 8.25.3.4 double bratl::CCriteriaLatLon::GetLowerRightLon ( ) [inline]

## Returns

lower right longitude of the lat/lon box, `Double.MAX_VALUE` if not set.

## 8.25.3.5 double bratl::CCriteriaLatLon::GetMinOrMaxLon ( double lon1, double lon2, bool wantMin ) [static]

Gets the min. or max. of two longitudes.

## Parameters

<i>lon1</i>	first longitude
<i>lon2</i>	second longitude
<i>wantMin</i>	true: returns min., false: returns max.



**Returns**

min. lon or max. lon, depends on wantMin.

References brathl::CTools::Max(), and brathl::CTools::Min().

**8.25.3.6 double brathl::CCriteriaLatLon::GetUpperLeftLat ( ) [inline]****Returns**

upper left latitude of the lat/lon box, Double.MAX\_VALUE if not set.

**8.25.3.7 double brathl::CCriteriaLatLon::GetUpperLeftLon ( ) [inline]****Returns**

upper left longitude of the lat/lon box, Double.MAX\_VALUE if not set.

**8.25.3.8 double brathl::CCriteriaLatLon::GetUpperRightLat ( ) [inline]****Returns**

upper right latitude of the lat/lon box, Double.MAX\_VALUE if not set.

**8.25.3.9 double brathl::CCriteriaLatLon::GetUpperRightLon ( ) [inline]****Returns**

upper right longitude of the lat/lon box, Double.MAX\_VALUE if not set.

**8.25.3.10 bool brathl::CCriteriaLatLon::Intersect ( CLatLonRect & clip, CLatLonRect & intersect )**

Create the intersection of this LatLon Criteria with the given one

**Parameters**

<i>clip</i>	intersect with this
<i>intersection</i>	

**Returns**

true, or false if there is no intersection

**8.25.3.11 bool brathl::CCriteriaLatLon::IsDefaultValue ( ) [virtual]**

Tests whether date period have been initialized or not

**Returns**

true if not initialized

Implements **brathl::CCriteria** (p. 140).

**8.25.3.12 void brathl::CCriteriaLatLon::Set ( CLatLonRect & latLonRect )**

Setter of the property `latLonRect`

**Parameters**

<i>latLonRect</i>	The latLonRect to set.
-------------------	------------------------

8.25.3.13 void brathl::CCriteriaLatLon::Set ( CLatLonPoint & *p1*, double *deltaLat*, double *deltaLon* )

Set a lat/lon bounding box from a point, and a delta lat, lon. This disambiguates which way the box wraps around the globe.

Parameters

<i>p1</i>	one corner of the box
<i>deltaLat</i>	delta lat from p1. (may be positive or negative)
<i>deltaLon</i>	delta lon from p1. (may be positive or negative)

8.25.3.14 void brathl::CCriteriaLatLon::Set ( CLatLonPoint & *latLonLow*, CLatLonPoint & *latLonHigh* )

Setter of the property `latLonRect`;

Parameters

<i>latLonLow</i>	lat/lon low point
<i>latLonHigh</i>	lat/lon high point .property name="latLonRect"

8.25.3.15 void brathl::CCriteriaLatLon::Set ( double *latLow*, double *lonLow*, double *latHigh*, double *lonHigh* )

Setter of the property `latLonRect`;

Parameters

<i>latLow</i>	latitude low
<i>lonLow</i>	longitude low
<i>latHigh</i>	latitude high
<i>lonHigh</i>	longitude high

8.25.3.16 void brathl::CCriteriaLatLon::Set ( const std::string & *latLow*, const std::string & *lonLow*, const std::string & *latHigh*, const std::string & *lonHigh* )

Setter of the property `latLonRect`;

Parameters

<i>latLow</i>	latitude low
<i>lonLow</i>	longitude low
<i>latHigh</i>	latitude high
<i>lonHigh</i>	longitude high

8.25.3.17 void brathl::CCriteriaLatLon::Set ( const std::string & *latLonRect*, const std::string & *delimiter* = CLatLonRect::m\_delimiter )

Setter of the property `latLonRect`;

Parameters

<i>latLonRect</i>	latitude low, longitude low, latitude high, longitude high
-------------------	--

8.25.3.18 void brathl::CCriteriaLatLon::SetDefaultValue ( ) [virtual]

Sets internal value to the default value (uninitialized)

Implements **brathl::CCriteria** (p. 140).

## 8.25.4 Member Data Documentation

## 8.25.4.1 CLatLonRect bratl::CCriteriaLatLon::m\_latLonRect [protected]

Bounding box for latitude/longitude points. This is a rectangle in lat/lon coordinates. Note that LatLonPoint always has lon in the range +/-180. \*

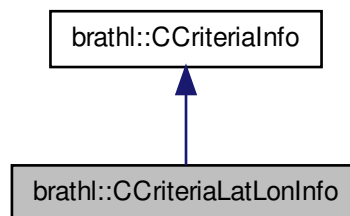
The documentation for this class was generated from the following files:

- CCriteriaLatLon.h
- CCriteriaLatLon.cpp

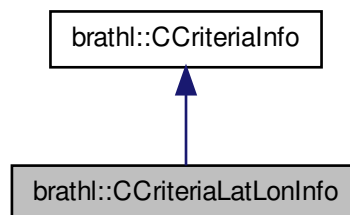
## 8.26 bratl::CCriteriaLatLonInfo Class Reference

```
#include <CriteriaInfo.h>
```

Inheritance diagram for bratl::CCriteriaLatLonInfo:



Collaboration diagram for bratl::CCriteriaLatLonInfo:



## Public Member Functions

- **CCriteriaLatLonInfo** ()  
*Empty CCriteriaLatLonInfo (p. 161) ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*

- CFieldInfo \* **GetEndLatField** ()
- const std::string & **GetEndLatFieldName** ()
- CFieldInfo \* **GetEndLonField** ()
- const std::string & **GetEndLonFieldName** ()
- virtual void **GetFieldsInfo** (CObMap \*fieldsInfo)
- CFieldInfo \* **GetStartLatField** ()
- const std::string & **GetStartLatFieldName** ()
- CFieldInfo \* **GetStartLonField** ()
- const std::string & **GetStartLonFieldName** ()
- void **SetEndLatField** (const std::string &value)
- void **SetEndLatField** (CFieldInfo &value)
- void **SetEndLonField** (const std::string &value)
- void **SetEndLonField** (CFieldInfo &value)
- void **SetStartLatField** (const std::string &value)
- void **SetStartLatField** (CFieldInfo &value)
- void **SetStartLonField** (const std::string &value)
- void **SetStartLonField** (CFieldInfo &value)
- virtual ~**CCriteriaLatLonInfo** ()

*Destructor.*

#### Static Public Member Functions

- static **CCriteriaLatLonInfo** \* **GetCriteriaInfo** (CBratObject \*ob, bool withExcept=true)

#### Protected Attributes

- CFieldInfo **m\_endLatField**
- CFieldInfo **m\_endLonField**
- CFieldInfo **m\_startLatField**
- CFieldInfo **m\_startLonField**

#### 8.26.1 Detailed Description

Lat/Lon criteria information management class.

#### Version

1.0

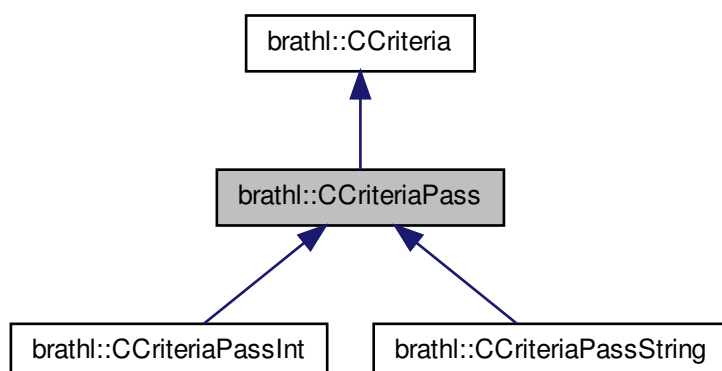
The documentation for this class was generated from the following files:

- CriteriaInfo.h
- CriteriaInfo.cpp

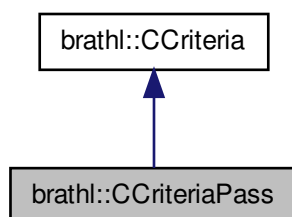
## 8.27 brathl::CCriteriaPass Class Reference

```
#include <CriteriaPass.h>
```

Inheritance diagram for bratl::CCriteriaPass:



Collaboration diagram for bratl::CCriteriaPass:



#### Public Member Functions

- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual bool **IsDefaultValue** ()=0
- virtual void **SetDefaultValue** ()=0
- virtual **~CCriteriaPass** ()  
*Destructor.*

#### Static Public Member Functions

- static **CCriteriaPass** \* **GetCriteria** (CBratObject \*ob, bool withExcept=true)

#### Protected Member Functions

- **CCriteriaPass** ()

Empty **CCriteriaPass** (p. 162) ctor.

- void **Init** ()

#### Additional Inherited Members

##### 8.27.1 Detailed Description

Pass number Criteria management class.

#### Version

1.0

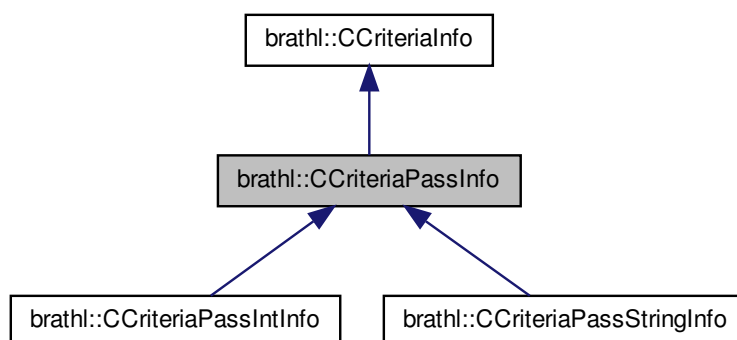
The documentation for this class was generated from the following files:

- CriteriaPass.h
- CriteriaPass.cpp

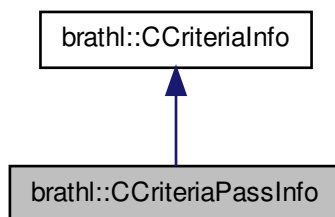
## 8.28 bratl::CCriteriaPassInfo Class Reference

```
#include <CriteriaInfo.h>
```

Inheritance diagram for bratl::CCriteriaPassInfo:



Collaboration diagram for brathl::CCriteriaPassInfo:



#### Public Member Functions

- **CCriteriaPassInfo** ()  
*Empty **CCriteriaPassInfo** (p. 164) ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- CFieldInfo \* **GetEndPassField** ()
- const std::string & **GetEndPassFieldName** ()
- virtual void **GetFieldsInfo** (CObMap \*fieldsInfo)
- CFieldInfo \* **GetStartPassField** ()
- const std::string & **GetStartPassFieldName** ()
- void **SetEndPassField** (const std::string &value)
- void **SetEndPassField** (CFieldInfo &value)
- void **SetStartPassField** (const std::string &value)
- void **SetStartPassField** (CFieldInfo &value)
- virtual ~**CCriteriaPassInfo** ()  
*Destructor.*

#### Static Public Member Functions

- static **CCriteriaPassInfo** \* **GetCriteriaInfo** (CBratObject \*ob, bool withExcept=true)

#### Protected Attributes

- CFieldInfo **m\_endPassField**
- CFieldInfo **m\_startPassField**

#### 8.28.1 Detailed Description

Pass criteria information management class.

#### Version

1.0

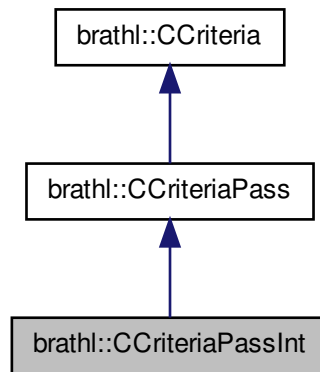
The documentation for this class was generated from the following files:

- CriteriaInfo.h
- CriteriaInfo.cpp

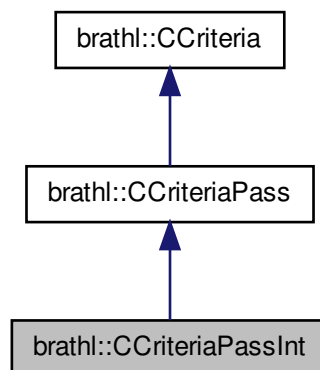
## 8.29 bratl::CCriteriaPassInt Class Reference

```
#include <CriteriaPass.h>
```

Inheritance diagram for bratl::CCriteriaPassInt:



Collaboration diagram for bratl::CCriteriaPassInt:



### Public Member Functions

- **CCriteriaPassInt** ()  
*Empty CCriteriaPassInt (p. 166) ctor.*
- **CCriteriaPassInt** (CCriteriaPassInt &c)
- **CCriteriaPassInt** (CCriteriaPassInt \*c)
- **CCriteriaPassInt** (int32\_t from, int32\_t to)
- **CCriteriaPassInt** (const std::string &from, const std::string &to)
- **CCriteriaPassInt** (const CStringArray &array)



- virtual void **Dump** (std::ostream &fOut=std::cerr)
  - Dump function.*
- std::string **GetAsText** (const std::string &delimiter=CCriteriaPassInt::m\_delimiter)
- int32\_t **GetFrom** ()
- int32\_t **GetTo** ()
- bool **Intersect** (CStringArray &array, CStringArray &intersect)
- bool **Intersect** (CStringArray &array, CIntArray &intersect)
- bool **Intersect** (CIntArray &array, CStringArray &intersect)
- bool **Intersect** (CIntArray &array, CIntArray &intersect)
- bool **Intersect** (int32\_t from, int32\_t to, CStringArray &intersect)
- bool **Intersect** (int32\_t from, int32\_t to, CIntArray &intersect)
- bool **Intersect** (double otherFrom, double otherTo, CIntArray &intersect)
- bool **Intersect** (const std::string &from, const std::string &to, CIntArray &intersect)
- bool **Intersect** (const std::string &from, const std::string &to, CStringArray &intersect)
- bool **IsDefaultValue** ()
- const **CCriteriaPassInt** & **operator=** (**CCriteriaPassInt** &c)
- void **Set** (**CCriteriaPassInt** &c)
- void **Set** (int32\_t from, int32\_t to)
- void **Set** (const std::string &from, const std::string &to)
- void **Set** (const CStringArray &array)
- void **SetDefaultValue** ()
- void **SetFrom** (int32\_t from)
- void **SetFrom** (const std::string &from)
- void **SetFromText** (const std::string &values, const std::string &delimiter=CCriteriaPassInt::m\_delimiter)
- void **SetTo** (int32\_t to)
- void **SetTo** (const std::string &to)
- virtual ~**CCriteriaPassInt** ()
  - Destructor.*

#### Static Public Member Functions

- static **CCriteriaPassInt** \* **GetCriteria** (CBratObject \*ob, bool withExcept=true)

#### Static Public Attributes

- static const std::string **m\_delimiter** = " "

#### Protected Member Functions

- void **Adjust** ()
- void **Init** ()

#### Protected Attributes

- int32\_t **m\_from**
- int32\_t **m\_to**

### Additional Inherited Members

#### 8.29.1 Detailed Description

Pass number (from/to) Criteria management class.

#### Version

1.0

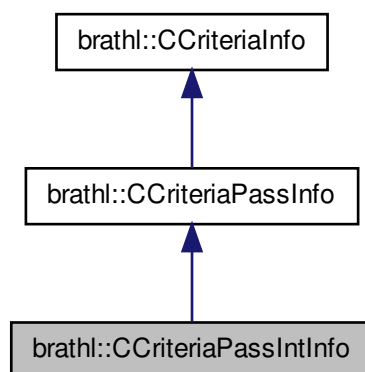
The documentation for this class was generated from the following files:

- CriteriaPass.h
- CriteriaPass.cpp

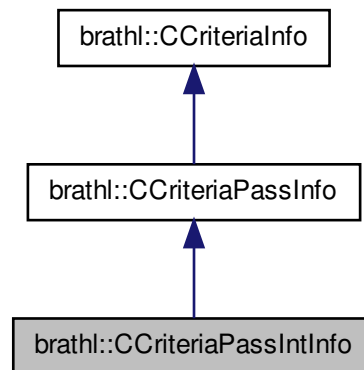
### 8.30 brathl::CCriteriaPassIntInfo Class Reference

```
#include <CriteriaInfo.h>
```

Inheritance diagram for brathl::CCriteriaPassIntInfo:



Collaboration diagram for bratl::CCriteriaPassIntInfo:



#### Public Member Functions

- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*

#### Static Public Member Functions

- static **CCriteriaPassIntInfo \* GetCriterialInfo** (CBratObject \*ob, bool withExcept=true)

#### Additional Inherited Members

##### 8.30.1 Detailed Description

Integer Pass criteria information management class.

#### Version

1.0

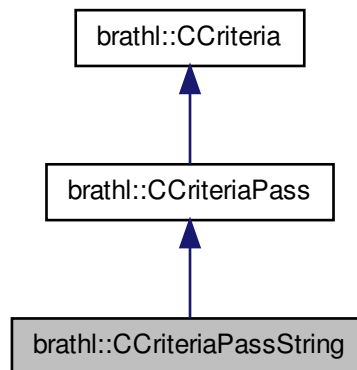
The documentation for this class was generated from the following files:

- CriterialInfo.h
- CriterialInfo.cpp

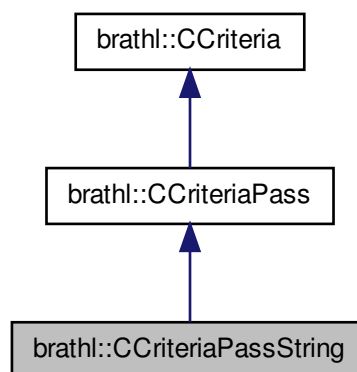
## 8.31 bratl::CCriteriaPassString Class Reference

```
#include <CriteriaPass.h>
```

Inheritance diagram for bratl::CCriteriaPassString:



Collaboration diagram for bratl::CCriteriaPassString:



#### Public Member Functions

- **CCriteriaPassString** ()  
*Empty CCriteriaPassString (p. 169) ctor.*
- **CCriteriaPassString** (CCriteriaPassString &c)
- **CCriteriaPassString** (CCriteriaPassString \*c)
- **CCriteriaPassString** (const std::string &passes, const std::string &delimiter=CCriteriaPassString::m\_delimiter)
- **CCriteriaPassString** (const CStringArray &array)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- std::string **GetAsText** (const std::string &delimiter=CCriteriaPassString::m\_delimiter)

- CStringArray \* **GetPasses** ()
  - bool **Intersect** (const std::string &passes, CStringArray &intersect)
  - bool **Intersect** (CStringArray &passes, CStringArray &intersect)
  - bool **IsDefaultValue** ()
  - const **CCriteriaPassString** & **operator=** (**CCriteriaPassString** &c)
  - void **Set** (const std::string &passes, const std::string &delimiter=CCriteriaPassString::m\_delimiter)
  - void **Set** (const CStringArray &array)
  - void **Set** (**CCriteriaPassString** &c)
  - void **SetDefaultValue** ()
  - virtual ~**CCriteriaPassString** ()
- Destructor.*

#### Static Public Member Functions

- static **CCriteriaPassString** \* **GetCriteria** (CBratObject \*ob, bool withExcept=true)

#### Static Public Attributes

- static const std::string **m\_delimiter** = ","

#### Protected Member Functions

- void **Init** ()

#### Static Protected Member Functions

- static void **ExtractPass** (const std::string &passes, CStringArray &arrayPass, const std::string &delimiter=CCriteriaPassString::m\_delimiter)
- static void **ExtractPass** (const CStringArray &array, CStringArray &arrayPass)

#### Protected Attributes

- CStringArray **m\_passes**

#### Additional Inherited Members

##### 8.31.1 Detailed Description

Pass number (as std::string) Criteria management class.

#### Version

1.0

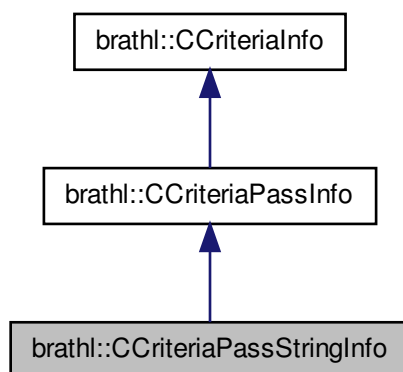
The documentation for this class was generated from the following files:

- CriteriaPass.h
- CriteriaPass.cpp

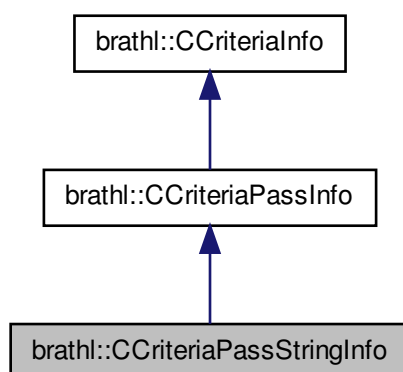
## 8.32 bratl::CCriteriaPassStringInfo Class Reference

```
#include <CriteriaInfo.h>
```

Inheritance diagram for bratl::CCriteriaPassStringInfo:



Collaboration diagram for bratl::CCriteriaPassStringInfo:



### Public Member Functions

- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*

### Static Public Member Functions

- static **CCriteriaPassStringInfo** \* **GetCriteriaInfo** (CBratObject \*ob, bool withExcept=true)

#### Additional Inherited Members

##### 8.32.1 Detailed Description

String Pass criteria information management class.

#### Version

1.0

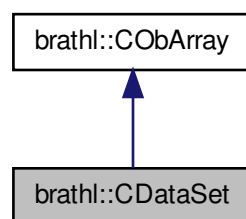
The documentation for this class was generated from the following files:

- CriteriaInfo.h
- CriteriaInfo.cpp

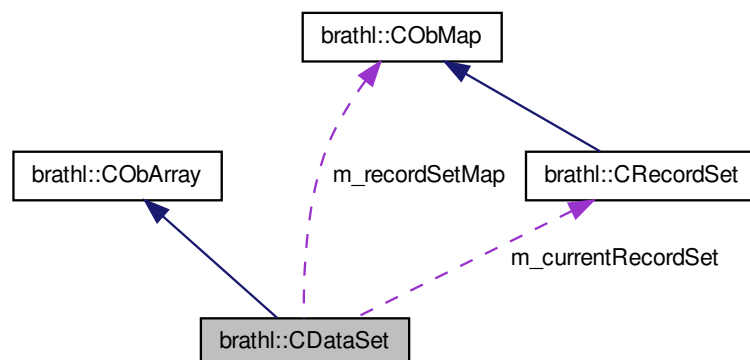
### 8.33 brathl::CDataSet Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CDataSet:



Collaboration diagram for brathl::CDataSet:



## Public Member Functions

- **CRecordSet \* Back** (bool withExcept=true)
- **CDataSet** (const std::string &name="", bool bDelete=true)  
*Ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual bool **Erase** (CRecordSet \*recordSet)
- bool **EraseCurrentRecordSet** ()
- void **EraseFieldSet** (const std::string &fieldSetKey)
- **CRecordSet \* FindRecord** (const std::string &recordSetName)
- **CRecordSet \* GetCurrentRecordSet** ()
- **CFieldSet \* GetFieldSet** (const std::string &fieldSetKey)
- **CFieldSetArrayDbI \* GetFieldSetAsArrayDbI** (const std::string &fieldSetKey)
- **CFieldSetDbI \* GetFieldSetAsDbI** (const std::string &fieldSetKey)
- double **GetFieldSetAsDbIValue** (const std::string &fieldSetKey)
- **CFieldSetString \* GetFieldSetAsString** (const std::string &fieldSetKey)
- std::string **GetFieldSetAsStringValue** (const std::string &fieldSetKey)
- **CRecordSet \* GetFirstRecordSet** ()
- const std::string & **GetName** ()
- **CRecord \* GetRecord** (const std::string &recordSetName)
- **CRecord \* GetRecord** (CRecordSet \*recordSet)
- **CRecordSet \* GetRecordSet** (CDataSet::iterator itDataSet)
- **CRecordSet \* GetRecordSet** (int32\_t index)
- **CObMap \* GetRecordSetMap** ()
- void **InsertDataset** (CDataSet \*dataSet, bool setAsCurrent=true)
- void **InsertFieldSet** (const std::string &fieldSetKey, CFieldSet \*fieldSet)
- **CRecordSet \* InsertRecord** (const std::string &recordSetName, bool setAsCurrent=true)
- virtual void **RemoveAll** ()
- void **SetCurrentRecordSet** (int32\_t index)
- void **SetCurrentRecordSet** (CDataSet::iterator itDataSet)
- void **SetCurrentRecordSet** (const std::string &recordSetName)
- void **SetCurrentRecordSet** (CRecordSet \*recordSet)
- void **SetName** (const std::string &name)
- virtual ~**CDataSet** ()  
*Dtor.*

## Protected Attributes

- **CRecordSet \* m\_currentRecordSet**
- std::string **m\_name**
- **CObMap m\_recordSetMap**

## 8.33.1 Detailed Description

a set of recordset management classes.

## Version

1.0



## 8.33.2 Member Function Documentation

8.33.2.1 void brathl::CDataSet::Dump ( std::ostream & *fOut* = std::cerr ) [virtual]

Dump fonction.

Copy a new **CDataSet** (p. 173) to the object

Referenced by EraseFieldSet(), and InsertFieldSet().

8.33.2.2 void brathl::CDataSet::EraseFieldSet ( const std::string & *fieldSetKey* )

remove a fieldset object (identify by its name) from the current recordset

## Parameters

<i>fieldSetKey</i>	[in] : fieldset key
--------------------	---------------------

References Dump(), brathl::CObMap::Erase(), and brathl::CTools::Format().

8.33.2.3 CFieldSet \* brathl::CDataSet::GetFieldSet ( const std::string & *fieldSetKey* )

Gets the fieldset object (identify by its name) of the current recordset

## Parameters

<i>fieldSetKey</i>	[in] : fieldset key to be searched
--------------------	------------------------------------

## Returns

a pointer to the fieldset object if found, otherwise NULL

8.33.2.4 void brathl::CDataSet::InsertFieldSet ( const std::string & *fieldSetKey*, CFieldSet \* *fieldSet* )

Inserts a fieldset object (identify by its name) into the current recordset

## Parameters

<i>fieldSetKey</i>	[in] : fieldset key
<i>fieldSet</i>	[in] : fieldset object to be inserted

References Dump(), brathl::CTools::Format(), and brathl::CObMap::Insert().

## 8.33.2.5 void brathl::CDataSet::RemoveAll ( ) [virtual]

Remove all elements and clear the std::list

Reimplemented from **brathl::CObArray** (p. 42).

References brathl::CObMap::RemoveAll().

The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

## 8.34 brathl::CDate Class Reference

```
#include <Date.h>
```

## Public Member Functions

- **int32\_t Add** (const **CDate** &d)
- **int32\_t AddDays** (uint32\_t days)
- **std::string AsString** (const std::string &format="", bool withMuSecond=false)
- **CDate** ()  
*Constructs a date with a 1950/01/01 value.*
- **CDate** (const char \*strDate)
- **CDate** (const **CDate** &date)  
*Constructs a date from another **CDate** (p. 175) object.*
- **CDate** (const uint32\_t year, const uint32\_t month=1, const uint32\_t day=1, const uint32\_t hour=0, const uint32\_t minute=0, const uint32\_t second=0, const uint32\_t muSecond=0)  
*Constructs a date from year, month, day, hour, minute, second, microsecond.*
- **CDate** (const uint32\_t days, const uint32\_t seconds, const uint32\_t muSeconds, const **brathl\_refDate** refDate=**REF19500101**)  
*Constructs a date from days, seconds, microseconds.*
- **CDate** (const double days, const double seconds, const double muSeconds, const **brathl\_refDate** refDate=**REF19500101**)  
*Constructs a date from days, seconds, microseconds.*
- **CDate** (const double dateSeconds, **brathl\_refDate** refDate=**REF19500101**)
- **CDate** (**brathl\_refDate** refDate)
- **int32\_t ConstructDate** (const **brathl\_refDate** refDate)
- **int32\_t Convert2DecimalJulian** (double &julian, const **brathl\_refDate** refDate=**REF19500101**)
- **int32\_t Convert2DMM** (int32\_t &days, int32\_t &milliSeconds, int32\_t &muSeconds, const **brathl\_refDate** refDate=**REF19500101**)
- **int32\_t Convert2DMM** (double &days, double &milliSeconds, double &muSeconds, const **brathl\_refDate** refDate=**REF19500101**)
- **int32\_t Convert2DSM** (int32\_t &days, int32\_t &seconds, int32\_t &muSeconds, const **brathl\_refDate** refDate=**REF19500101**)
- **int32\_t Convert2DSM** (double &days, double &seconds, double &muSeconds, const **brathl\_refDate** refDate=**REF19500101**)
- **int32\_t Convert2Second** (double &seconds, const **brathl\_refDate** refDate=**REF19500101**)
- **int32\_t Convert2SM** (int32\_t &seconds, int32\_t &muSeconds, const **brathl\_refDate** refDate=**REF19500101**)
- **int32\_t Convert2SM** (double &seconds, double &muSeconds, const **brathl\_refDate** refDate=**REF19500101**)
- **int32\_t Convert2YMDHMSM** (uint32\_t &year, uint32\_t &month, uint32\_t &day, uint32\_t &hour, uint32\_t &minute, uint32\_t &second, uint32\_t &muSecond) const
- **uint32\_t DayOfYear** ()
- **virtual void Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- **uint32\_t GetDay** ()  
*Gets the day of the date.*
- **uint32\_t GetHour** ()  
*Gets the hour of the date.*
- **uint32\_t GetMinute** ()  
*Gets the minutes of the date.*
- **uint32\_t GetMonth** ()  
*Gets the month of the date.*
- **uint32\_t GetMuSecond** ()  
*Gets the microseconds of the date.*
- **uint32\_t GetSecond** ()  
*Gets the seconds of the date.*
- **uint32\_t GetYear** () const  
*Gets the year of the date.*

- uint32\_t **HowManyLeapYear** (const uint32\_t year) const
- void **InitDateZero** ()
- bool **IsDefaultValue** () const
- bool **IsLeapYear** ()
- int32\_t **LeapYearIndex** ()
- double **operator+** (CDate &d)
- double **operator-** (CDate &d)
- const CDate & **operator=** (const CDate &date)
- const CDate & **operator=** (const char \*strDate)
- const CDate & **operator=** (double seconds)
- const CDate & **operator=** (const brathl\_refDate refDate)
- int32\_t **SetDate** (const char \*strDate)
- int32\_t **SetDate** (const brathl\_DateYMDHMSM &date)
- int32\_t **SetDate** (const brathl\_DateDSM &date)
- int32\_t **SetDate** (const uint32\_t days, const uint32\_t seconds, const uint32\_t muSeconds, const brathl\_refDate refDate=REF19500101)
- int32\_t **SetDate** (const double days, const double seconds, const double muSeconds, const brathl\_refDate refDate=REF19500101)
- int32\_t **SetDate** (const brathl\_DateSecond &date)
- int32\_t **SetDate** (const brathl\_DateJulian &date)
- int32\_t **SetDate** (const uint32\_t year, const uint32\_t month=1, const uint32\_t day=1, const uint32\_t hour=0, const uint32\_t minute=0, const uint32\_t second=0, const uint32\_t muSecond=0)
- int32\_t **SetDate** (const double dateSeconds, brathl\_refDate refDate=REF19500101)
- int32\_t **SetDateJulian** (const double dateJulian, brathl\_refDate refDate=REF19500101)
- int32\_t **SetDateNow** ()
- void **SetDefaultValue** ()
- int32\_t **SubtractDays** (uint32\_t days)
- double **Value** ()  
*returns the date in a number of seconds since internal reference date, ie 1950)*
- double **ValueJulian** ()  
*returns the date in a decimal julian day (since internal reference date, ie 1950)*
- bool **operator<** (CDate &d)
- bool **operator<** (double d)
- bool **operator>** (CDate &d)
- bool **operator>** (double d)
- bool **operator==** (CDate &d)
- bool **operator==** (double d)
- bool **operator<=** (CDate &d)
- bool **operator<=** (double d)
- bool **operator>=** (CDate &d)
- bool **operator>=** (double d)
- bool **operator!=** (CDate &d)
- bool **operator!=** (double d)

#### Static Public Member Functions

- static int32\_t **CheckDate** (const uint32\_t year, const uint32\_t month=1, const uint32\_t day=1, const uint32\_t hour=0, const uint32\_t minute=0, const uint32\_t second=0, const uint32\_t muSecond=0)
- static int32\_t **CheckDay** (uint32\_t day, uint32\_t month, uint32\_t year)
- static int32\_t **CheckHour** (uint32\_t hour)
- static int32\_t **CheckMinute** (uint32\_t minute)
- static int32\_t **CheckMonth** (uint32\_t month)
- static int32\_t **CheckMuSecond** (uint32\_t muSecond)

- static int32\_t **CheckSecond** (uint32\_t second)
- static int32\_t **CheckYear** (uint32\_t year)
- static double **CvDate** (const char \*strDate)
- static uint32\_t **DayOfYear** (uint32\_t year, uint32\_t month, uint32\_t day)
- static uint32\_t **DayOfYear** (CDate &date)
- static int32\_t **GetDateRef** (const CDate &date, brathl\_refDate &refDate)
- static int32\_t **GetDaysInMonth** (const uint32\_t month, const uint32\_t year, uint32\_t &nbDaysInMonth)
- static bool **IsCharDate** (const char \*strDate)
- static bool **IsLeapYear** (const uint32\_t year)
- static int32\_t **LeapYearIndex** (const uint32\_t year)

#### Static Public Attributes

- static const uint32\_t **m\_daysInMonth** [2][12]
- static const uint32\_t **m\_daysOfYear** [2][12]
- static const char \* **m\_DEFAULT\_UNIT\_SECOND** = "second"
- static const uint32\_t **m\_internalRefYear** = 1950
- static const double **m\_minutesInDay** = 1440.0
- static const double **m\_minutesInHour** = 60.0
- static const double **m\_secInDay** = 86400.0
- static const double **m\_secInHour** = 3600.0
- static const double **m\_secInMinute** = 60.0

#### 8.34.1 Detailed Description

Date management and conversion class.

This class allows calendar an date conversion.

#### Warning

Date before 1950/01/01 00:00:00:00 are not accepted

#### Version

1.0

#### 8.34.2 Constructor & Destructor Documentation

##### 8.34.2.1 brathl::CDate::CDate ( const char \* *strDate* )

Constructs a date from a std::string

#### Parameters

<i>strDate</i>	: Allowed format are : <ul style="list-style-type: none"> <li>• YYYY-MM-DD HH:MN:SS.MS std::string</li> <li>• a julian std::string (format:positive 'Days Seconds Microseconds' or positive decimal julian day)</li> </ul>
----------------	--

##### 8.34.2.2 brathl::CDate::CDate ( const double *dateSeconds*, brathl\_refDate *refDate* = REF19500101 )

Constructs a date value from a decimal number of seconds

## Parameters

<i>dateSeconds</i>	[in]: decimal number of seconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

## 8.34.3 Member Function Documentation

8.34.3.1 `int32_t brathl::CDate::Add ( const CDate & d )`

Adds a date to the date object

## Parameters

<i>d</i>	[in]: a <b>CDate</b> (p. 175) object to add
----------	---

## Returns

#BRATHL\_SUCCESS or error code (see `Date_error_codes`)

8.34.3.2 `int32_t brathl::CDate::AddDays ( uint32_t days )`

Adds a number of day to the date object

## Parameters

<i>days</i>	[in]: number of days to add (if < 0, a subtract operation is performed)
-------------	---

## Returns

#BRATHL\_SUCCESS or error code (see `Date_error_codes`)

References `m_minutesInDay`.

8.34.3.3 `std::string brathl::CDate::AsString ( const std::string & format = " ", bool withMuSecond = false )`

Formats a date as `std::string`.

## Parameters

<i>Format</i>	[in] : String controlling how the date will be converted into std::string. This format std::string consists of zero or more conversion specifications and ordinary characters. A conversion specification consists of a " (percent) character and one or two terminating conversion characters that determine the conversion specification's behavior. All ordinary characters are copied unchanged into the result. Each conversion specification is replaced by appropriate characters as described in the following list. The appropriate characters are determined by the LC_TIME category of the program's locale. %% Same as %. a Locale's abbreviated weekday name. A Locale's full weekday name. b Locale's abbreviated month name. B Locale's full month name. c Locale's appropriate date and time representation. C Century number (the year divided by 100 and truncated to an integer as a decimal number [1,99]); single digits are preceded by 0; see standards(5). d Day of month [1,31]; single digits are preceded by 0. H Hour (24-hour clock) [0,23]; single digits are preceded by 0. I Hour (12-hour clock) [1,12]; single digits are preceded by 0. j Day number of year [1,366]; single digits are preceded by 0. m Month number [1,12]; single digits are preceded by 0. M Minute [00,59]; leading 0 is permitted but not required. p Locale's equivalent of either a.m. or p.m. S Seconds [00,61]; the range of values is [00,61] rather than [00,59] to allow for the occasional leap second and even more occasional double leap second. U Week number of year as a decimal number [00,53], with Sunday as the first day of week 1. w Weekday as a decimal number [0,6], with 0 representing Sunday. W Week number of year as a decimal number [00,53], with Monday as the first day of week 1. x Locale's appropriate date representation. X Locale's appropriate time representation. y Year within century [00,99]. Y Year, including the century (for example 1993). Z Time zone name or abbreviation, or no bytes if no time zone information exists. If the format is an empty std::string it is forced to be "%Y-%m-%d %H:%M:%S" (ISO 8601)
<i>withMuSecond</i>	[in] : add the microseconds of the date at the end of the std::string (format "%.06u")

**Returns**

Formatted std::string

References brathl::CTools::Format().

**8.34.3.4** `int32_t brathl::CDate::CheckDate ( const uint32_t year, const uint32_t month = 1, const uint32_t day = 1, const uint32_t hour = 0, const uint32_t minute = 0, const uint32_t second = 0, const uint32_t muSecond = 0 ) [static]`

Check if a date value (year, month, day, hour, minute, second, microsecond ) is valid

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

**8.34.3.5** `int32_t brathl::CDate::CheckDay ( uint32_t day, uint32_t month, uint32_t year ) [static]`

Checks if a day value is valid, according to a month an a year

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

**8.34.3.6** `int32_t brathl::CDate::CheckHour ( uint32_t hour ) [static]`

Checks if an hour value is valid

**Returns**

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

**8.34.3.7** `int32_t brathl::CDate::CheckMinute ( uint32_t minute ) [static]`

Checks if a minute is valid

Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

**8.34.3.8** `int32_t brathl::CDate::CheckMonth ( uint32_t month ) [static]`

Checks if a month value is valid

Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

Referenced by DayOfYear().

**8.34.3.9** `int32_t brathl::CDate::CheckMuSecond ( uint32_t muSecond ) [static]`

Checks if a month value is valid

Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

**8.34.3.10** `int32_t brathl::CDate::CheckSecond ( uint32_t second ) [static]`

Checks if a second value is valid

Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

**8.34.3.11** `int32_t brathl::CDate::CheckYear ( uint32_t year ) [static]`

Checks if a year value is valid year have to be >= internal reference year (1950)

Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_internalRefYear.

Referenced by DayOfYear().

**8.34.3.12** `int32_t brathl::CDate::ConstructDate ( const brathl_refDate refDate )`

Converts a date whose value corresponds to the date reference enumeration

Parameters

<i>refDate</i>	[in]: date reference - see <b>brathl_refDate</b> (p. 338))
----------------	--

Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References brathl\_refDateUser1, brathl\_refDateUser2, REF19500101, REF19580101, REF19850101, REF19900101, REF20000101, REFUSER1, and REFUSER2.

#### 8.34.3.13 int32\_t brathl::CDate::Convert2DecimalJulian ( double & *julian*, const brathl\_refDate *refDate* = REF19500101 )

Converts the date value into a decimal julian day

##### Parameters

<i>julian</i>	[out]: decimal julian day (can be < 0)
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

##### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_secInDay.

Referenced by brathl\_DSM2Julian(), brathl\_Seconds2Julian(), brathl\_YMDHMSM2Julian(), and brathl::CMission::Convert().

#### 8.34.3.14 int32\_t brathl::CDate::Convert2DMM ( int32\_t & *days*, int32\_t & *milliSeconds*, int32\_t & *muSeconds*, const brathl\_refDate *refDate* = REF19500101 )

Converts the date value into a number of days, milliseconds, microseconds

##### Parameters

<i>days</i>	[out]: number of days (can be < 0)
<i>milliSeconds</i>	[out]: number of milliseconds
<i>muSeconds</i>	[out]: number of microseconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

##### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_minutesInDay, m\_secInDay, and m\_secInMinute.

#### 8.34.3.15 int32\_t brathl::CDate::Convert2DMM ( double & *days*, double & *milliSeconds*, double & *muSeconds*, const brathl\_refDate *refDate* = REF19500101 )

Converts the date value into a number of days, milliseconds, microseconds

##### Parameters

<i>days</i>	[out]: number of days (can be < 0)
<i>milliSeconds</i>	[out]: number of milliseconds
<i>muSeconds</i>	[out]: number of microseconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

##### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

#### 8.34.3.16 int32\_t brathl::CDate::Convert2DSM ( int32\_t & *days*, int32\_t & *seconds*, int32\_t & *muSeconds*, const brathl\_refDate *refDate* = REF19500101 )

Converts the date value into a number of days, seconds, microseconds



## Parameters

<i>days</i>	[out]: number of days (can be < 0)
<i>seconds</i>	[out]: number of seconds
<i>muSeconds</i>	[out]: number of microseconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_minutesInDay, m\_secInDay, and m\_secInMinute.

Referenced by brathl\_Julian2DSM(), brathl\_Seconds2DSM(), and brathl\_YMDHMSM2DSM().

8.34.3.17 `int32_t brathl::CDate::Convert2DSM ( double & days, double & seconds, double & muSeconds, const brathl_refDate refDate = REF19500101 )`

Converts the date value into a number of days, seconds, microseconds

## Parameters

<i>days</i>	[out]: number of days (can be < 0)
<i>seconds</i>	[out]: number of seconds
<i>muSeconds</i>	[out]: number of microseconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

8.34.3.18 `int32_t brathl::CDate::Convert2Second ( double & seconds, const brathl_refDate refDate = REF19500101 )`

Converts the date value into a decimal number of seconds

## Parameters

<i>seconds</i>	[out]: decimal number of seconds day (can be < 0)
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References Value().

Referenced by brathl\_DSM2Seconds(), brathl\_Julian2Seconds(), and brathl\_YMDHMSM2Seconds().

8.34.3.19 `int32_t brathl::CDate::Convert2SM ( int32_t & seconds, int32_t & muSeconds, const brathl_refDate refDate = REF19500101 )`

Converts the date value into a number of seconds, microseconds

## Parameters

<i>seconds</i>	[out]: number of milliseconds (can be < 0)
<i>muSeconds</i>	[out]: number of microseconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_secInMinute.

8.34.3.20 `int32_t brathl::CDate::Convert2SM ( double & seconds, double & muSeconds, const brathl_refDate refDate = REF19500101 )`

Converts the date value into a number of seconds, microseconds

## Parameters

<i>seconds</i>	[out]: number of milliseconds (can be < 0)
<i>muSeconds</i>	[out]: number of microseconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

8.34.3.21 `int32_t brathl::CDate::Convert2YMDHMSM ( uint32_t & year, uint32_t & month, uint32_t & day, uint32_t & hour, uint32_t & minute, uint32_t & second, uint32_t & muSecond ) const`

Converts the date value into year, month, day, hour, minute, second, microsecond

## Parameters

<i>year</i>	[out]: year
<i>month</i>	[out]: month
<i>day</i>	[out]: day
<i>hour</i>	[out]: hour
<i>minute</i>	[out]: minute
<i>second</i>	[out]: second
<i>muSecond</i>	[out]: microsecond

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_daysOfYear, m\_internalRefYear, m\_minutesInDay, and m\_minutesInHour.

Referenced by `brathl_Cycle2YMDHMSM()`, `brathl_DSM2YMDHMSM()`, `brathl_Julian2YMDHMSM()`, `brathl_NowYMDHMSM()`, and `brathl_Seconds2YMDHMSM()`.

8.34.3.22 `double brathl::CDate::CvDate ( const char * strDate ) [static]`

Convert a date std::string to a number of seconds since internal reference year (ie 1950) Allowed format are :

- YYYY-MM-DD HH:MM:SS.MS std::string
- a julian std::string (format:positive 'Days Seconds Microseconds' or positive decimal julian day) For julian std::string, it can contain its date reference at the end by specifying where YYYY the reference year. If no date reference is specified the default date reference is used.

## Parameters

<i>strDate</i>	: date std::string
----------------	--------------------

**Returns**

number of seconds since internal reference year (ie 1950)

References brathl::CTools::Format(), SetDate(), and Value().

**8.34.3.23** `uint32_t brathl::CDate::DayOfYear ( uint32_t year, uint32_t month, uint32_t day ) [static]`

Retrieves the day of a year if year is not valid, methods force the value to the internal reference year (1950) if month is not valid, methods force the value to 1 day value is not check

**Parameters**

<i>year</i>	[in]: year
<i>month</i>	[in]: month of year
<i>day</i>	[in]: day of the month

**Returns**

the day of year

References CheckMonth(), CheckYear(), LeapYearIndex(), m\_daysOfYear, and m\_internalRefYear.

Referenced by brathl\_DayOfYear().

**8.34.3.24** `uint32_t brathl::CDate::DayOfYear ( CDate & date ) [static]`

Retrieves the day of year of a **CDate** (p. 175) object

**Parameters**

<i>date</i>	[in]: date
-------------	------------

**Returns**

the day of year

References GetDay(), GetMonth(), LeapYearIndex(), and m\_daysOfYear.

**8.34.3.25** `uint32_t brathl::CDate::DayOfYear ( )`

Retrieves the day of year of the date object

**Returns**

the day of year

**8.34.3.26** `int32_t brathl::CDate::GetDateRef ( const CDate & date, brathl_refDate & refDate ) [static]`

Construct a date reference enumeration according to a **CDate** (p. 175) object Only date according to **brathl\_refDate** (p. 338) enumeration are valid, furthermore REFUSER1 and REFUSER2 are not allowed.

**Parameters**

<i>date</i>	[int] : <b>CDate</b> (p. 175) object whose value corresponds to the refDate parameter
<i>refDate</i>	[out]: date reference enumeration value (see <b>brathl_refDate</b> (p. 338))

## Returns

#BRATHL\_SUCCESS if **CDate** (p. 175) object is according to **brathl\_refDate** (p. 338) enumeration except REFUSER1 and REFUSER2. Otherwise returns a error code (see Date\_error\_codes)

References GetYear(), REF19500101, REF19580101, REF19850101, REF19900101, and REF20000101.

8.34.3.27 `int32_t brathl::CDate::GetDaysInMonth ( const uint32_t month, const uint32_t year, uint32_t & nbDaysInMonth )`  
[static]

Retrieves the number of days in a month, according to a year and a month

## Parameters

<i>month</i>	[in] : month
<i>year</i>	[in] : year
<i>nbDaysInMonth[out]</i>	: number of days in the month

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

8.34.3.28 `uint32_t brathl::CDate::HowManyLeapYear ( const uint32_t year ) const`

Computes the number of leap years since a year

## Parameters

<i>year</i>	[in]: year
-------------	------------

## Returns

number of leap years

References IsLeapYear(), and m\_internalRefYear.

8.34.3.29 `void brathl::CDate::InitDateZero ( )`

Initializes a **CDate** (p. 175) object to 0

8.34.3.30 `bool brathl::CDate::IsDefaultValue ( ) const`

Tests the internal value to the default value

## Returns

true if default value, otherwise false

Referenced by brathl::CDatePeriod::Intersect().

8.34.3.31 `bool brathl::CDate::IsLeapYear ( const uint32_t year )` [static]

Testd if the year is a leap year

## Parameters

<i>year</i>	[in]: year to test
-------------	--------------------

## Returns

true if the year is a leap year, otherwise false

## 8.34.3.32 bool brathl::CDate::IsLeapYear ( )

Tests if the year of the date object is a leap year

## Returns

true if the year of the date object is a leap year, otherwise false

Referenced by HowManyLeapYear(), and LeapYearIndex().

## 8.34.3.33 int32\_t brathl::CDate::LeapYearIndex ( const uint32\_t year ) [static]

Retrieves the index of the **m\_daysOfYear** (p. 191) or **m\_daysInMonth** (p. 191) arrays in accordance with the year (leap year or not)

## Parameters

<i>year</i>	[in]: year to test
-------------	--------------------

## Returns

0 if year is a leap year, otherwise 1

References IsLeapYear().

Referenced by DayOfYear().

## 8.34.3.34 int32\_t brathl::CDate::LeapYearIndex ( )

Retrieve sthe index of the daysOfYear or daysInMonth arrays in accordance with the year of the date object (leap year or not)

## Returns

0 if year of the date object is a leap year, otherwise 1

Referenced by DayOfYear().

## 8.34.3.35 double brathl::CDate::operator+ ( CDate &amp; d ) [inline]

Plus operator redefinition Computes the addition of two dates, the result is expressed in a decimal number of seconds

References Value().

## 8.34.3.36 double brathl::CDate::operator- ( CDate &amp; d ) [inline]

Minus operator redefinition Computes the difference between two dates, the result is expressed in a decimal number of seconds

References Value().

## 8.34.3.37 bool brathl::CDate::operator&lt; ( CDate &amp; d ) [inline]

Comparison operators

References Value().

8.34.3.38 `const CDate & brathl::CDate::operator= ( const CDate & date )`

Assigns a new value to the **CDate** (p. 175) object, with a **CDate** (p. 175) object

8.34.3.39 `const CDate & brathl::CDate::operator= ( const char * strDate )`

Assigns a new value to the **CDate** (p. 175) object, with a date `std::string` (format: YYYY-MM-DD HH:MN:SS.MS)

8.34.3.40 `const CDate & brathl::CDate::operator= ( double seconds )`

Assigns a new value to the **CDate** (p. 175) object, with a number of seconds since 1950-01-01

8.34.3.41 `const CDate & brathl::CDate::operator= ( const brathl_refDate refDate )`

Assigns a new value to the **CDate** (p. 175) object, with a reference date

8.34.3.42 `int32_t brathl::CDate::SetDate ( const char * strDate )`

Sets date value from a `std::string` Allowed format are :

- YYYY-MM-DD HH:MN:SS.MS `std::string`
- a julian `std::string` (format: positive 'Days Seconds Microseconds' or positive decimal julian day) For julian `std::string`, it can contain its date reference at the end by specifying where YYYY the reference year. If no date reference is specified the default date reference is used.

#### Parameters

<i>strDate</i>	: date <code>std::string</code>
----------------	---------------------------------

#### Returns

#BRATHL\_SUCCESS or error code (see `Date_error_codes`)

Referenced by `brathl_DayOfYear()`, `brathl_DiffDSM()`, `brathl_DiffJulian()`, `brathl_DiffYMDHMSM()`, `brathl_DSM2-Julian()`, `brathl_DSM2Seconds()`, `brathl_DSM2YMDHMSM()`, `brathl_Julian2DSM()`, `brathl_Julian2Seconds()`, `brathl_Julian2YMDHMSM()`, `brathl_Seconds2DSM()`, `brathl_Seconds2Julian()`, `brathl_Seconds2YMDHMSM()`, `brathl_YMDHMSM2Cycle()`, `brathl_YMDHMSM2DSM()`, `brathl_YMDHMSM2Julian()`, `brathl_YMDHMSM2Seconds()`, and `CvDate()`.

8.34.3.43 `int32_t brathl::CDate::SetDate ( const brathl_DateYMDHMSM & date )`

Sets date value from a **brathl\_DateYMDHMSM** (p. 338) structure

#### Parameters

<i>date</i>	[in]: <b>brathl_DateYMDHMSM</b> (p. 338) structure date
-------------	---

#### Returns

#BRATHL\_SUCCESS or error code (see `Date_error_codes`)

8.34.3.44 `int32_t brathl::CDate::SetDate ( const brathl_DateDSM & date )`

Sets date value from a **brathl\_DateDSM** (p. 338) structure

#### Parameters

<i>date</i>	[in]: <b>brathl_DateDSM</b> (p. 338) structure date
-------------	---

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References `_structDateDSM::days`, `_structDateDSM::muSeconds`, `_structDateDSM::refDate`, and `_structDateDSM::seconds`.

8.34.3.45 `int32_t brathl::CDate::SetDate ( const uint32_t days, const uint32_t seconds, const uint32_t muSeconds, const brathl_refDate refDate = REF19500101 )`

Sets date value from year, month, day, hour, minute, second, microsecond

## Parameters

<i>days</i>	[in]: number of days
<i>seconds</i>	[in]: number of seconds
<i>muSeconds</i>	[in]: number of microseconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

8.34.3.46 `int32_t brathl::CDate::SetDate ( const brathl_DateSecond & date )`

Sets date value from a **brathl\_DateSecond** (p. 338) structure

## Parameters

<i>date</i>	[in]: <b>brathl_DateSecond</b> (p. 338) structure date
-------------	--

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References `_structDateSecond::nbSeconds`, and `_structDateSecond::refDate`.

8.34.3.47 `int32_t brathl::CDate::SetDate ( const brathl_DateJulian & date )`

Sets date value from a **brathl\_DateJulian** (p. 338) structure

## Parameters

<i>date</i>	[in]: <b>brathl_DateJulian</b> (p. 338) structure date
-------------	--

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References `_structDateJulian::julian`, and `_structDateJulian::refDate`.

8.34.3.48 `int32_t brathl::CDate::SetDate ( const uint32_t year, const uint32_t month = 1, const uint32_t day = 1, const uint32_t hour = 0, const uint32_t minute = 0, const uint32_t second = 0, const uint32_t muSecond = 0 )`

Sets date value from year, month, day, hour, minute, second, microsecond

## Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

#### 8.34.3.49 int32\_t brathl::CDate::SetDate ( const double *dateSeconds*, brathl\_refDate *refDate* = REF19500101 )

Sets date value from a decimal number of seconds

##### Parameters

<i>dateSeconds</i>	[in]: decimal number of seconds
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

##### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_secInMinute.

#### 8.34.3.50 int32\_t brathl::CDate::SetDateJulian ( const double *dateJulian*, brathl\_refDate *refDate* = REF19500101 )

Sets date value from a decimal julian day

##### Parameters

<i>dateJulian</i>	[in]: decimal julian day
<i>refDate</i>	[in]: date reference (default value is REF19500101 - see <b>brathl_refDate</b> (p. 338))

##### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_minutesInDay, m\_secInMinute, and ValueJulian().

Referenced by brathl::CMission::Convert().

#### 8.34.3.51 int32\_t brathl::CDate::SetDateNow ( )

Sets the date object to the current time

##### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

Referenced by brathl\_NowYMDHMSM().

#### 8.34.3.52 void brathl::CDate::SetDefaultValue ( )

Sets internal value to the default value

#### 8.34.3.53 int32\_t brathl::CDate::SubtractDays ( uint32\_t *days* )

Subtracts a number of day from the date object

##### Parameters

<i>days</i>	[in]: number of days to subtract (if < 0, a addition operation is performed)
-------------	--

##### Returns

#BRATHL\_SUCCESS or error code (see Date\_error\_codes)

References m\_minutesInDay.



## 8.34.4 Member Data Documentation

8.34.4.1 `const uint32_t brathl::CDate::m_daysInMonth` `[static]`**Initial value:**

```
{
    { 31, 29, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31 },
    { 31, 28, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31 }
}
```

Array[i,j] of number of days in month i : 0 corresponds to a leap year, 1 corresponds to a non-leap year j : index of the month

8.34.4.2 `const uint32_t brathl::CDate::m_daysOfYear` `[static]`**Initial value:**

```
{
    { 0, 31, 60, 91, 121, 152, 182, 213, 244, 274, 305, 335 },
    { 0, 31, 59, 90, 120, 151, 181, 212, 243, 273, 304, 334 }
}
```

Array[i,j] of day of year i : 0 corresponds to a leap year, 1 corresponds to a non-leap year j : index of the month  
Referenced by `Convert2YMDHMSM()`, and `DayOfYear()`.

8.34.4.3 `const uint32_t brathl::CDate::m_internalRefYear = 1950` `[static]`

Internal reference year (1950)

Referenced by `CheckYear()`, `Convert2YMDHMSM()`, `DayOfYear()`, and `HowManyLeapYear()`.

8.34.4.4 `const double brathl::CDate::m_minutesInDay = 1440.0` `[static]`

Number of minutes in a day

Referenced by `AddDays()`, `Convert2DMM()`, `Convert2DSM()`, `Convert2YMDHMSM()`, `SetDateJulian()`, and `SubtractDays()`.

8.34.4.5 `const double brathl::CDate::m_minutesInHour = 60.0` `[static]`

Number of minutes in an hour

Referenced by `Convert2YMDHMSM()`.

8.34.4.6 `const double brathl::CDate::m_secInDay = 86400.0` `[static]`

Number of seconds in a day

Referenced by `Convert2DecimalJulian()`, `Convert2DMM()`, and `Convert2DSM()`.

8.34.4.7 `const double brathl::CDate::m_secInHour = 3600.0` `[static]`

Number of seconds in an hour

8.34.4.8 `const double brathl::CDate::m_secInMinute = 60.0` `[static]`

Number of seconds in a minute

Referenced by `Convert2DMM()`, `Convert2DSM()`, `Convert2SM()`, `SetDate()`, and `SetDateJulian()`.

The documentation for this class was generated from the following files:

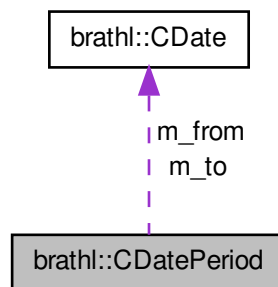
- `Date.h`
- `Date.cpp`

## 8.35 brathl::CDatePeriod Class Reference

```
#include <DatePeriod.h>
```

Inherits brathl::CBratObject.

Collaboration diagram for brathl::CDatePeriod:



## Public Member Functions

- `std::string AsString` (const `std::string` &format="", bool withMuSecond=false)
- `CDatePeriod` ()  
*Empty CDatePeriod (p. 192) ctor.*
- `CDatePeriod` (`CDatePeriod` &datePeriod)
- `CDatePeriod` (`CDate` &from, `CDate` &to)
- `CDatePeriod` (const `std::string` &from, const `std::string` &to)
- `CDatePeriod` (double from, double to)
- `CDatePeriod` (const `CStringArray` &array)
- virtual void `Dump` (`std::ostream` &fOut=`std::cerr`)  
*Dump function.*
- `std::string GetAsText` (const `std::string` &delimiter=`CDatePeriod::m_delimiter`)
- `std::string GetFormat` ()
- `CDate & GetFrom` ()
- `std::string GetFromAsText` ()
- `CDate & GetTo` ()
- `std::string GetToAsText` ()
- bool `GetWithMuSecond` ()
- bool `Intersect` (`CDatePeriod` &datePeriod, `CDatePeriod` &intersect)
- bool `Intersect` (`CDate` &otherFrom, `CDate` &otherTo, `CDatePeriod` &intersect)
- bool `IsDefaultValue` ()
- const `CDatePeriod & operator=` (`CDatePeriod` &datePeriod)
- void `Set` (`CDate` &from, `CDate` &to)
- void `Set` (const `std::string` &from, const `std::string` &to)
- void `Set` (double from, double to)
- void `Set` (const `CStringArray` &array)
- void `Set` (`CDatePeriod` &datePeriod)
- void `SetDefaultValue` ()
- void `SetFormat` (const `std::string` &value)
- void `SetFrom` (`CDate` &from)

- void **SetFrom** (const std::string &strDate)
- void **SetTo** (CDate &to)
- void **SetTo** (const std::string &strDate)
- void **SetWithMuSecond** (bool value)
- bool **Union** (CDatePeriod &datePeriod)
- bool **Union** (CDate &otherFrom, CDate &otherTo)
- bool **Union** (CDatePeriod &datePeriod, CDatePeriod &unionDate)
- bool **Union** (CDate &otherFrom, CDate &otherTo, CDatePeriod &unionDate)
- virtual ~CDatePeriod ()

*Destructor.*

#### Static Public Attributes

- static const std::string **m\_delimiter** = "/"

#### Protected Member Functions

- void **Adjust** ()
- void **Init** ()

#### Protected Attributes

- std::string **m\_format**
- CDate **m\_from**
- CDate **m\_to**
- bool **m\_withMuSecond**

#### 8.35.1 Detailed Description

Date interval management class.

#### Version

1.0

#### 8.35.2 Constructor & Destructor Documentation

##### 8.35.2.1 brathl::CDatePeriod::CDatePeriod ( CDatePeriod & datePeriod )

Copy constructor.

#### Parameters

<i>datePeriod</i>	period to set
-------------------	---------------

##### 8.35.2.2 brathl::CDatePeriod::CDatePeriod ( CDate & from, CDate & to )

Constructor.

#### Parameters

<i>from</i>	start date
<i>to</i>	end date

8.35.2.3 brathl::CDatePeriod::CDatePeriod ( const std::string & *from*, const std::string & *to* )

Constructor.

## Parameters

<i>from</i>	start date
<i>to</i>	end date

8.35.2.4 brathl::CDatePeriod::CDatePeriod ( double *from*, double *to* )

Constructor.

## Parameters

<i>from</i>	start date (number of seconds since 1950-01-01)
<i>to</i>	end date (number of seconds since 1950-01-01)

8.35.2.5 brathl::CDatePeriod::CDatePeriod ( const CStringArray & *array* )

Constructor from a array that contains start date as std::string, end date as std::string

## Parameters

<i>array</i>	start and end dates
--------------	---------------------

## 8.35.3 Member Function Documentation

## 8.35.3.1 CDate&amp; brathl::CDatePeriod::GetFrom ( ) [inline]

Gets start date

## Returns

start date

Referenced by Intersect(), and Set().

## 8.35.3.2 CDate&amp; brathl::CDatePeriod::GetTo ( ) [inline]

Gets end date

## Returns

end date

Referenced by Intersect(), and Set().

8.35.3.3 bool brathl::CDatePeriod::Intersect ( CDatePeriod & *datePeriod*, CDatePeriod & *intersect* )

Create the intersection of this date period with the given one

## Parameters

<i>datePeriod</i>	intersect with this
<i>intersect</i>	intersection period

## Returns

true, or false if there is no intersection

References GetFrom(), and GetTo().

#### 8.35.3.4 bool brathl::CDatePeriod::Intersect ( CDate & otherFrom, CDate & otherTo, CDatePeriod & intersect )

Create the intersection of this date period with the given one

## Parameters

<i>otherFrom</i>	start date intersect with this
<i>otherTo</i>	end date intersect with this
<i>intersect</i>	intersection period

## Returns

true, or false if there is no intersection

References brathl::CDate::IsDefaultValue(), SetFrom(), and SetTo().

#### 8.35.3.5 bool brathl::CDatePeriod::IsDefaultValue ( )

Tests whether date period have been initialized or not

## Returns

true if not initialized

#### 8.35.3.6 const CDatePeriod & brathl::CDatePeriod::operator= ( CDatePeriod & datePeriod )

Assigns a new value to the **CDatePeriod** (p. 192) object, with a **CDatePeriod** (p. 192) object

#### 8.35.3.7 void brathl::CDatePeriod::Set ( CDate & from, CDate & to )

Sets date period from start and end date

## Parameters

<i>from</i>	start date
<i>to</i>	end date

#### 8.35.3.8 void brathl::CDatePeriod::Set ( const std::string & from, const std::string & to )

Sets date period from start and end date

## Parameters

<i>from</i>	start date
<i>to</i>	end date

#### 8.35.3.9 void brathl::CDatePeriod::Set ( const CStringArray & array )

Sets a date period from a array that contains start date as std::string, end date as std::string

## Parameters

<i>array</i>	start and end dates
--------------	---------------------

**8.35.3.10 void brathl::CDatePeriod::Set ( CDatePeriod & *datePeriod* )**

Sets date period from another one

**Parameters**

<i>datePeriod</i>	period to set
-------------------	---------------

References GetFrom(), and GetTo().

**8.35.3.11 void brathl::CDatePeriod::SetDefaultValue ( )**

Sets internal value to the default value (uninitialized)

**8.35.3.12 void brathl::CDatePeriod::SetFrom ( CDate & *from* )**

Sets start date

**Parameters**

<i>to</i>	start date
-----------	------------

Referenced by Intersect().

**8.35.3.13 void brathl::CDatePeriod::SetFrom ( const std::string & *strDate* )**

Sets start date

**Parameters**

<i>to</i>	start date
-----------	------------

References brathl::CTools::Format().

**8.35.3.14 void brathl::CDatePeriod::SetTo ( CDate & *to* )**

Sets end date

**Parameters**

<i>to</i>	end date
-----------	----------

Referenced by Intersect().

**8.35.3.15 void brathl::CDatePeriod::SetTo ( const std::string & *strDate* )**

Sets end date

**Parameters**

<i>to</i>	end date
-----------	----------

References brathl::CTools::Format().

**8.35.4 Member Data Documentation****8.35.4.1 CDate brathl::CDatePeriod::m\_from** [protected]

Start date

## 8.35.4.2 CDate brathl::CDatePeriod::m\_to [protected]

End date

The documentation for this class was generated from the following files:

- DatePeriod.h
- DatePeriod.cpp

## 8.36 brathl::CDoubleMap Class Reference

```
#include <List.h>
```

## Public Member Functions

- **CDoubleMap** ()  
*CDoubleMap* (p. 197) ctor.
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual bool **Erase** (CDoubleMap::iterator it)
- virtual bool **Erase** (const std::string &key)
- virtual double **Exists** (const std::string &key) const
- virtual double **Insert** (const std::string &key, double value, bool withExcept=true)
- virtual double **operator[]** (const std::string &key)
- virtual void **RemoveAll** ()
- virtual ~**CDoubleMap** ()  
*CDoubleMap* (p. 197) dtor.

## 8.36.1 Detailed Description

a set of double value management classes.

## Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.37 brathl::CDoublePtrArray Class Reference

```
#include <List.h>
```

## Public Member Functions

- **CDoublePtrArray** (bool bDelete=true)  
*Empty CDoublePtrArray* (p. 197) ctor.
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual bool **Erase** (CDoublePtrArray::iterator it)
- virtual bool **Erase** (int32\_t index)

- bool **GetDelete** ()
- uint32\_t **GetMatrixDim** (uint32\_t row)
- CUIntArray \* **GetMatrixDims** ()
- size\_t **GetMatrixNumberOfDims** ()
- virtual void **Insert** (DoublePtr ob)
- virtual CDoublePtrArray::iterator **InsertAt** (CDoublePtrArray::iterator where, DoublePtr ob)
- DoublePtr **NewMatrix** (double initialValue=CTools::m\_defaultValueDOUBLE)
- virtual bool **PopBack** ()
- virtual void **RemoveAll** ()
- virtual CDoublePtrArray::iterator **ReplaceAt** (CDoublePtrArray::iterator where, DoublePtr ob)
- void **SetDelete** (bool value)
- void **SetMatrixDims** (const CUIntArray &matrixDims)
- virtual ~**CDoublePtrArray** ()

*Destructor.*

#### Protected Member Functions

- void **Delete** (DoublePtr matrix)

#### Protected Attributes

- bool **m\_bDelete**
- CUIntArray **m\_matrixDims**

#### 8.37.1 Detailed Description

An array (std::vector) of duple pointer management class.

#### Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.38 brathl::CDoublePtrDoubleMap Class Reference

```
#include <List.h>
```

#### Public Member Functions

- **CDoublePtrDoubleMap** (bool bDelete=true)  
*CDoublePtrDoubleMap* (p. 198) *ctor.*
- **CDoublePtrDoubleMap** (const CUIntArray &matrixDims, bool bDelete=true)
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual bool **Erase** (CDoublePtrDoubleMap::iterator it)
- virtual bool **Erase** (double key)
- virtual DoublePtr \* **Exists** (double key) const
- bool **GetDelete** ()
- virtual void **GetKeys** (CDoubleArray &keys, bool bRemoveAll=true)



- uint32\_t **GetMatrixColDim** (uint32\_t row)
- CUIntArray \* **GetMatrixDims** ()
- size\_t **GetMatrixNumberOfRows** () const
- virtual DoublePtr \* **Insert** (double key, DoublePtr \*ob, bool withExcept=true)
- virtual DoublePtr \* **Insert** (double key, double initialValue=**CTools::m\_defaultValueDOUBLE**)
- DoublePtr \* **NewMatrix** (double initialValue=**CTools::m\_defaultValueDOUBLE**)
- virtual DoublePtr \* **operator[]** (double key)
- virtual void **RemoveAll** ()
- bool **RenameKey** (double oldKey, double newKey)
- void **SetDelete** (bool value)
- void **SetMatrixDims** (const CUIntArray &matrixDims)
- virtual ~**CDoublePtrDoubleMap** ()

*CDoublePtrDoubleMap* (p. 198) dtor.

#### Protected Member Functions

- void **Delete** (DoublePtr \*matrix)

#### Protected Attributes

- bool **m\_bDelete**
- CUIntArray **m\_matrixDims**

#### 8.38.1 Detailed Description

a set of a non rectangular matrix of double management classes.

#### Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.39 brathl::CExpressionValue Class Reference

```
#include <Expression.h>
```

Inherits brathl::CBratObject.

#### Public Member Functions

- std::string **AsString** (const CUnit &Unit=CUnit(""), const std::string Format="", bool dateAsPeriod=false) const
- **CExpressionValue** (double FloatValue=**CTools::m\_defaultValueDOUBLE**)
- **CExpressionValue** (const std::vector< double > &FloatValues)
- **CExpressionValue** (const std::string &StrValue)
- **CExpressionValue** (ExpressionValueType Type, ExpressionValueDimensions &Dimensions, double \*Value, bool MakeCopy=true)
- **CExpressionValue** (ExpressionValueType type, ExpressionValueDimensions &dimensions, const CDouble-Array &value)
- **CExpressionValue** (const **CExpressionValue** &Copy)

- **CExpressionValue** (ExpressionCallableFunction1 &Function, bool IsNumeric, **CExpressionValue** &Parameter1)
- **CExpressionValue** (ExpressionCallableFunctionStrToStr1 &Function, **CExpressionValue** &Parameter1)
- **CExpressionValue** (ExpressionCallableFunctionStrToFlt1 &Function, **CExpressionValue** &Parameter1)
- **CExpressionValue** (ExpressionCallableFunction2 &Function, bool IsNumeric, **CExpressionValue** &Parameter1, **CExpressionValue** &Parameter2)
- **CExpressionValue** (ExpressionCallableFunction3 &Function, bool IsNumeric, **CExpressionValue** &Parameter1, **CExpressionValue** &Parameter2, **CExpressionValue** &Parameter3)
- **CExpressionValue** (ExpressionCallableFunctionAlgoN &function, const char \*functionName, CVectorBratAlgorithmParam &arg)
- **CExpressionValue** (ExpressionCallableFunctionBratAlgoBaseN &function, **CBratAlgorithmBase** \*algo, CVectorBratAlgorithmParam &arg)
- double **Compare** (**CExpressionValue** &WithWhat)
- void **DeleteValue** ()
- void **Dump** (std::ostream &fOut=std::cerr)
- const ExpressionValueDimensions & **GetDimensions** () const
- std::string **GetDimensionsAsString** ()
- std::string **GetName** ()
- size\_t **GetNbDimensions** () const
- size\_t **GetNbValues** () const
- std::string **GetString** () const
- ExpressionValueType **GetType** () const
- double **GetValue** (uint32\_t index) const
- double **GetValue** (uint32\_t i, uint32\_t j) const
- double \* **GetValues** () const
- bool **HasValue** ()
- int32\_t **IsTrue** ()
- **CExpressionValue** & **operator=** (const **CExpressionValue** &Copy)
- **CExpressionValue** & **operator=** (const std::string &String)
- **CExpressionValue** & **operator=** (double value)
- **CExpressionValue** & **operator=** (const std::vector< double > &Vector)
- void **Set** (const **CExpressionValue** &Copy)
- void **SetName** (const std::string &value)
- void **SetNewValue** (ExpressionValueType type, uint32\_t \*dims, uint32\_t nbDims, double \*value, bool makeCopy=true)
- void **SetNewValue** (ExpressionValueType Type, ExpressionValueDimensions &Dimensions, double \*Value, bool MakeCopy=true)
- void **SetNewValue** (CDoubleArray &vect, bool makeCopy=true)
- void **SetNewValue** (**CObDoubleMap** &mp, bool makeCopy=true)
- void **SetNewValue** (**CDoublePtrDoubleMap** &mp, bool makeCopy=true)
- void **SetNewValue** (double \*dataValue, uint32\_t nbValues, bool makeCopy=true)

#### Static Public Member Functions

- static **CExpressionValue** \* **GetExpressionValue** (CBratObject \*ob, bool withExcept=true)

#### 8.39.1 Detailed Description

Expression management classes.

#### Version

1.0

The documentation for this class was generated from the following files:

- Expression.h
- Expression.cpp

## 8.40 bratl::CExternalFilesAvisoGrid Class Reference

```
#include <ExternalFilesAvisoGrid.h>
```

Inherits bratl::CExternalFilesNetCDFCF.

Inherited by bratl::CExternalFilesDotGrid, and bratl::CExternalFilesMercatorDotGrid.

### Public Member Functions

- **CExternalFilesAvisoGrid** (const std::string &Name="")
- virtual void **GetValue** (const std::string &Name, **CExpressionValue** &Value, const std::string &WantedUnit)
- virtual void **GetValue** (const std::string &name, double &value, const std::string &wantedUnit)
- virtual bool **NextRecord** ()
- virtual bool **PrevRecord** ()
- virtual void **Rewind** ()

### Static Public Member Functions

- static std::string **TypeOf** ()

### Static Public Attributes

- static const std::string **m\_INTERNAL\_DEPTH\_DIM\_NAME** = "GridDepth"
- static const std::string **m\_INTERNAL\_LAT\_DIM\_NAME** = "NbLatitudes"
- static const std::string **m\_INTERNAL\_LATLON\_DIM\_NAME** = "LatLon"
- static const std::string **m\_INTERNAL\_LON\_DIM\_NAME** = "NbLongitudes"
- static const std::string **m\_LAT\_DIM\_NAME** = "Latitude"
- static const std::string **m\_LATLONMIN\_NAME** = "LatLonMin"
- static const std::string **m\_LATLONSTEP\_NAME** = "LatLonStep"
- static const std::string **m\_LON\_DIM\_NAME** = "Longitude"

### Protected Member Functions

- virtual void **AddBratIndexData** ()
- virtual void **AddVar** (int32\_t NetcdfId, const std::string &Name, const std::string &Description, const std::string &Unit, int32\_t type=NC\_NAT, const CUIntArray \*dimValues=NULL, const CStringArray \*dimNames=NULL, const CIntArray \*dimIds=NULL, const **CStringMap** \*mapAttributes=NULL)
- virtual void **AddVar** (const std::string &Name)
- virtual void **AddVar** (int32\_t netcdfId, const std::string &name, const std::string &description, const std::string &unit, int32\_t type, uint32\_t dimValue, const std::string dimName, int32\_t dimId, const **CStringMap** \*mapAttributes=NULL)
- void **AddVirtualVariables** ()
- void **CheckNetCDFDimensions** ()
- virtual void **CheckVariables** ()
- uint32\_t **CurrentMeasure** () const
- virtual void **FreeResources** ()
- virtual void **GetLatitudes** (double Min, double Step, uint32\_t Count, double \*Vector)
- virtual void **GetLongitudes** (double Min, double Step, uint32\_t Count, double \*Vector)
- void **Init** ()
- virtual void **LoadStructure** ()
- virtual void **SubstituteDimNames** (CStringArray &dimNames)

## Protected Attributes

- CNetCDFDimension \* **m\_depthDim**
- uint32\_t **m\_depthIndex**
- CNetCDFDimension \* **m\_latDim**
- uint32\_t **m\_latIndex**
- CNetCDFDimension \* **m\_lonDim**
- uint32\_t **m\_lonIndex**
- uint32\_t **m\_nbDepths**
- uint32\_t **m\_nbLatitudes**
- uint32\_t **m\_nbLongitudes**

## 8.40.1 Detailed Description

External files access.

## Version

1.0

## 8.40.2 Member Function Documentation

8.40.2.1 void bratl::CExternalFilesAvisoGrid::LoadStructure ( ) [protected],[virtual]

Array of the global dimension's index

Implements **bratl::CExternalFilesNetCDF** (p. 205).

The documentation for this class was generated from the following files:

- ExternalFilesAvisoGrid.h
- ExternalFilesAvisoGrid.cpp

## 8.41 bratl::CExternalFilesJason2 Class Reference

```
#include <ExternalFilesJason2.h>
```

Inherits bratl::CExternalFilesNetCDFCF.

Inherited by bratl::CExternalFilesJason2GDR, bratl::CExternalFilesJason2SGDR, and bratl::CExternalFilesJason2SSHA.

## Public Member Functions

- **CExternalFilesJason2** (const std::string &name="")

## Static Public Member Functions

- static std::string **TypeOf** ()

## Static Public Attributes

- static const std::string **m\_missionName** = CTools::StringToUpper(CMission::m\_nameJ2)

## Additional Inherited Members

## 8.41.1 Detailed Description

Jason-2 files access.

## Version

1.0

The documentation for this class was generated from the following files:

- ExternalFilesJason2.h
- ExternalFilesJason2.cpp

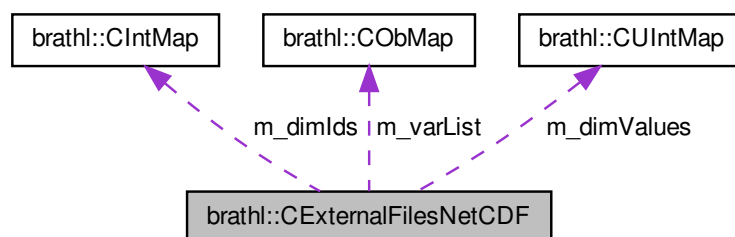
## 8.42 brathl::CExternalFilesNetCDF Class Reference

```
#include <ExternalFilesNetCDF.h>
```

Inherits brathl::CExternalFiles.

Inherited by brathl::CExternalFilesNetCDFCF.

Collaboration diagram for brathl::CExternalFilesNetCDF:



## Public Member Functions

- virtual void **AddAttributesAsField** (CFieldNetCdf \*field=NULL)
- virtual void **AddOffset** (double value, bool force=false)
- **CExternalFilesNetCDF** (const std::string &Name="")
- virtual void **Close** ()
- void **ExecuteExpression** (CExpression &expr, CExpressionValue &exprValue, const std::string &wantedUnit, CProduct \*product=NULL)
- virtual CFieldNetCdf \* **FindCycleField** ()
- virtual CFieldNetCdf \* **FindLatField** ()
- virtual CFieldNetCdf \* **FindLonField** ()
- virtual CFieldNetCdf \* **FindPassField** ()
- virtual CFieldNetCdf \* **FindTimeField** ()
- virtual void **GetAllValues** (const std::string &name, CExpressionValue &value, const std::string &wantedUnit)
- virtual void **GetAllValues** (const std::string &name, CDoubleArray &vect, const std::string &wantedUnit)
- virtual void **GetAllValues** (CFieldNetCdf \*field, CExpressionValue &value, const std::string &wantedUnit)

- virtual void **GetAllValues** (CFieldNetCdf \*field, const std::string &wantedUnit)
- int **GetAttribute** (const std::string &varName, const std::string &attName, double &attValue, bool mustExist=true, double defaultValue=CTools::m\_defaultValueDOUBLE)
- int **GetAttribute** (const std::string &varName, const std::string &attName, std::string &attValue, bool mustExist=true, std::string defaultValue="")
- nc\_type **GetAttributeType** (const std::string &attName)
- nc\_type **GetAttributeType** (const std::string &varName, const std::string &attName)
- virtual void **GetDimensions** (const std::string &varName, CUIntArray &dimensions)
- virtual void **GetDimensions** (const std::string &varName, CStringArray &dimensions)
- CIntMap & **GetDimIds** ()
- CUIntMap & **GetDimValues** ()
- virtual void **GetFieldNames** (CStringArray &names)
- CFieldNetCdf \* **GetFieldNetCdf** (const std::string &name, bool withExcept=true)
- virtual CObMap \* **GetFields** ()
- CNetCDFFiles \* **GetFile** ()
- int **GetGlobalAttribute** (const std::string &attName, double &attValue, bool mustExist=true, double defaultValue=CTools::m\_defaultValueDOUBLE)
- int **GetGlobalAttribute** (const std::string &attName, std::string &attValue, bool mustExist=true, std::string defaultValue="")
- void **GetGlobalAttributes** (CStringMap &mapAttributes)
- void **GetGlobalAttributes** (CDoubleMap &mapAttributes)
- void **GetGlobalAttributes** (std::string &attributes)
- virtual std::string **GetName** () const
- int32\_t **GetNetCdfId** (const std::string &name, bool withExcept=true)
- void **GetOrderedDimNames** (const std::string &value, CStringArray &commonDimensionNames)
- void **GetOrderedDimNames** (const CExpression &value, CStringArray &commonDimensionNames)
- void **GetOrderedDimNames** (const CStringArray \*fieldNames, CStringArray &commonDimensionNames)
- void **GetOrderedDimNamesFromFieldNetcdf** (const CStringArray \*fieldNames, CStringArray &commonDimensionNames)
- virtual void **GetValue** (const std::string &name, CExpressionValue &value, const std::string &wantedUnit)
- virtual void **GetValue** (const std::string &name, double &value, const std::string &wantedUnit)
- virtual void **GetValues** (const std::string &name, CExpressionValue &value, const std::string &wantedUnit)
- virtual void **GetValues** (CFieldNetCdf \*field, CExpressionValue &value, const std::string &wantedUnit)
- CFieldNetCdf \* **GetVarByAttribute** (const std::string &attrName, const std::string &attrValueToSearch)
- virtual void **GetVariables** (CStringArray &varNames)
- nc\_type **GetVarType** (const std::string &name)
- virtual std::string **GetVarTypeName** (const std::string &name)
- virtual bool **IsAxisVar** (const std::string &name)
- bool **IsLatField** (CFieldNetCdf \*field)
- bool **IsLonField** (CFieldNetCdf \*field)
- virtual bool **IsOpened** () const
- virtual int32\_t **NumberOfRecords** ()
- virtual void **Open** ()
- virtual void **SetMode** (brathl\_FileMode mode)
- virtual void **SetName** (const std::string &Name)
- virtual void **SetOffset** (double value, bool force=false)
- virtual bool **VarExists** (const std::string &name)

#### Static Public Member Functions

- static std::string **TypeOf** ()

## Protected Member Functions

- virtual void **AddBratIndexData** ()
- virtual void **AddVar** (int32\_t NetcdfId, const std::string &Name, const std::string &Description, const std::string &Unit, int32\_t type=NC\_NAT, const CUIntArray \*dimValues=NULL, const CStringArray \*dimNames=NULL, const CIntArray \*dimIds=NULL, const **CStringMap** \*mapAttributes=NULL)
- virtual void **AddVar** (int32\_t netcdfId, const std::string &name, const std::string &description, const std::string &unit, int32\_t type, uint32\_t dimValue, const std::string dimName, int32\_t dimId, const **CStringMap** \*mapAttributes=NULL)
- virtual void **AddVar** (const std::string &Name)
- virtual void **CheckDimensions** ()
- virtual void **CheckVariables** ()
- virtual void **FreeResources** ()
- virtual void **LoadStructure** ()=0
- void **SetOffset** (bool force=false)
- virtual void **SubstituteDimNames** (CStringArray &dimNames)

## Protected Attributes

- **CIntArray m\_dimIds**
- **CUIntArray m\_dimValues**
- **CNetCDFFiles m\_file**
- **uint32\_t m\_nbMeasures**
- **CObMap m\_varList**

## Additional Inherited Members

## 8.42.1 Detailed Description

External NetCdf files access.

## Version

1.0

## 8.42.2 Member Function Documentation

## 8.42.2.1 virtual void bratl::CExternalFilesNetCDF::LoadStructure ( ) [protected],[pure virtual]

Array of the global dimension's index

Implemented in **bratl::CExternalFilesAvisoGrid** (p. 202).

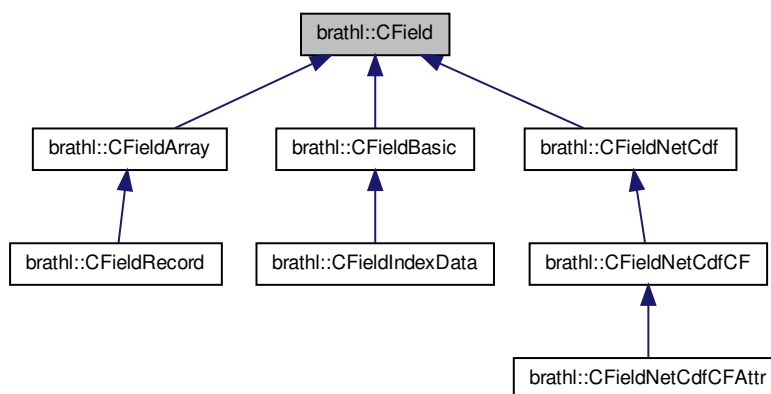
The documentation for this class was generated from the following files:

- ExternalFilesNetCDF.h
- ExternalFilesNetCDF.cpp

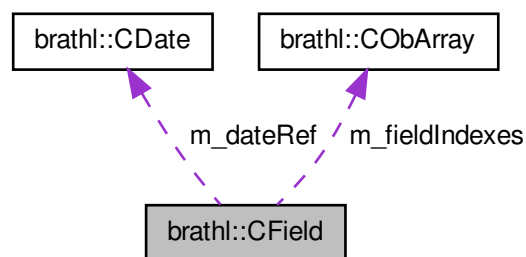
## 8.43 bratl::CField Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CField:



Collaboration diagram for brathl::CField:



## Classes

- class **CListField**

## Public Member Functions

- void **AddFieldIndexes** (CFieldIndex \*value)
- void **AddFieldIndexes** (CObArray \*vect, bool removeAll=true)
- virtual void **AddOffset** (double value)
- virtual void **AdjustValidMinMax** (double \*data, int32\_t size)
- virtual void **AdjustValidMinMax** (double value)
- **CField** ()  
*Ctor.*
- **CField** (const std::string &name, const std::string &description="", const std::string &unit="")
- **CField** (CField &f)
- void **Convert** (double \*data, int32\_t size)



- void **ConvertDefaultValueFloat** (double \*data, int32\_t size)
- void **ConvertDefaultValueInt16** (double \*data, int32\_t size)
- void **ConvertDefaultValueInt32** (double \*data, int32\_t size)
- void **ConvertDefaultValueInt64** (double \*data, int32\_t size)
- void **ConvertDefaultValueInt8** (double \*data, int32\_t size)
- void **ConvertDefaultValueUInt16** (double \*data, int32\_t size)
- void **ConvertDefaultValueUInt32** (double \*data, int32\_t size)
- void **ConvertDefaultValueUInt64** (double \*data, int32\_t size)
- void **ConvertDefaultValueUInt8** (double \*data, int32\_t size)
- virtual **CFieldSet \* CreateFieldSet** (const **CField::CListField** &listFields)=0
- void **DeleteFieldIndexes** ()
- virtual void **Dump** (std::ostream &fOut=std::cerr)
- Dump fonction.*
- virtual void **DumpFieldDictionary** (std::ostream &fOut=std::cout)
- bool **End** ()
- bool **GetConvertDate** ()
- int32\_t **GetCurrentPos** ()
- coda\_Cursor \* **GetCursor** ()
- const **CDate** & **GetDateRef** ()
- const std::string & **GetDescription** () const
- long \* **GetDim** ()
- virtual std::string **GetDimAsString** ()
- void **GetDimAsVector** (CUIntArray &dim)
- long **GetDimAt** (int32\_t index)
- bool **GetExpandArray** ()
- **CObArray** \* **GetFieldIndexes** ()
- virtual std::string **GetFullName** ()
- virtual std::string **GetFullNameWithRecord** ()
- virtual bool **GetHidden** ()
- virtual bool **GetHighResolution** ()
- int32\_t **GetIndex** ()
- const std::string & **GetKey** ()
- int **GetMaxPos** ()
- const std::string & **GetName** () const
- coda\_native\_type **GetNativeType** ()
- virtual std::string **GetNativeTypeName** ()
- int32\_t **GetNbDims** ()
- int **GetNbElts** ()
- virtual uint32\_t **GetNumHighResolutionMeasure** ()
- double **GetOffset** ()
- virtual uint32\_t **GetOffsetDim** ()
- virtual std::string **GetRecordName** ()
- coda\_special\_type **GetSpecialType** ()
- virtual std::string **GetSpecialTypeName** ()
- coda\_type\_class **GetTypeClass** ()
- int32\_t **GetUnion** ()
- const std::string & **GetUnit** () const
- double **GetValidMax** ()
- double **GetValidMin** ()
- virtual int32\_t **GetVirtualNbDims** ()
- void **HandleBratError** (const std::string &str="", int32\_t errClass=BRATHL\_LOGIC\_ERROR)
- bool **HasDim** ()
- bool **HasEqualDims** (**CField** \*field)
- virtual bool **HasVirtualNbDims** ()

- bool **HasXDim** ()
- bool **HasYDim** ()
- virtual bool **IsDimTransposed** ()
- bool **IsExpandArray** ()
- bool **IsFieldHasDefaultValue** ()
- bool **IsFieldNetCdfCAttr** ()
- bool **IsFixedSize** () const
- bool **IsGoToAvailableUnionField** ()
- virtual bool **IsHidden** ()
- virtual bool **IsHighResolution** ()
- bool **IsMetaData** ()
- virtual bool **IsSpecialType** ()
- bool **IsToBeRemoved** ()
- bool **IsUnion** ()
- virtual bool **IsVirtual** () const
- bool **LastRecord** ()
- const **CField** & **operator=** (**CField** &f)
- virtual void **PopCursor** ()=0
- void **PopRecordCusor** (**CObList** \*parentFieldList)
- virtual void **PushPos** ()=0
- virtual void **Read** (**CDoubleArray** &vect, bool skip=false)
- virtual void **Read** (double \*data, bool skip=false)
- virtual void **Read** (std::string &value, bool skip=false)
- virtual void **ReadParent** (**CDoubleArray** &vect, **CFieldRecord** \*parentField)
- virtual void **ReadParent** (**CDoubleArray** &vect, **CObList** \*parentFieldList)
- void **Set** (**CField** &f)
- void **SetConvertDate** (bool value)
- void **SetCurrentPos** (int32\_t currentPos)
- void **SetCurrentPosToLast** ()
- void **SetCursor** (coda\_Cursor &cursor)
- void **SetDateRef** (brathl\_refDate refDate)
- void **SetDateRef** (const **CDate** &value)
- void **SetDefaultValue** (double \*data, int32\_t size)
- void **SetDescription** (const std::string &description)
- void **SetDim** (int32\_t nbDims, const long dim[])
- void **SetDim** (int32\_t nbDims, const **CUIntArray** &dim)
- void **SetDim** (const **CUIntArray** &dim)
- void **SetDim** (const **CUIntArray** \*dim)
- void **SetDim** (int32\_t nbElts)
- void **SetExpandArray** (bool value)
- void **SetFieldHasDefaultValue** (bool value)
- void **SetFixedSize** (bool isFixedSize)
- void **SetGoToAvailableUnionField** (bool value)
- virtual void **SetHidden** (bool value)
- virtual void **SetHighResolution** (bool value)
- void **SetIndex** (int32\_t index)
- void **SetKey** (const std::string &key)
- void **SetMetaData** (bool metaData)
- void **SetName** (const std::string &name)
- void **SetNativeType** (coda\_native\_type nativeType)
- virtual void **SetNumHighResolutionMeasure** (uint32\_t value)
- virtual void **SetOffset** (double value)
- void **SetSpecialType** (coda\_special\_type specialType)
- void **SetToBeRemoved** (bool value)
- void **SetTypeClass** (coda\_type\_class typeClass)

- void **SetUnion** (int32\_t value)
- virtual void **SetUnit** (const std::string &unit)
- void **SetValidMax** (double value)
- void **SetValidMin** (double value)
- virtual void **SetVirtual** (bool value)
- bool **TransposeDim** ()
- bool **TransposeValues** (double \*data, int32\_t size)
- bool **UnitIsDate** ()
- virtual ~**CField** ()

*Dtor.*

#### Static Public Member Functions

- static void **AdjustValidMinMax** (double \*data, int32\_t size, double &min, double &max)
- static void **AdjustValidMinMax** (double value, double &min, double &max)
- static **CFieldNetCdfCFAttr** \* **GetFieldNetCdfCFAttr** (CBratObject \*ob, bool withExcept=true)
- static **CFieldNetCdfIndexData** \* **GetFieldNetCdfIndexData** (CBratObject \*ob, bool withExcept=true)
- static bool **IsFieldNetCdfCFAttr** (CBratObject \*ob)

#### Static Public Attributes

- static const std::string **m\_BRAT\_INDEX\_DATA\_DESC** = "data index"
- static const std::string **m\_BRAT\_INDEX\_DATA\_NAME** = "brat\_index\_data"

#### Protected Member Functions

- void **Init** ()

#### Protected Attributes

- bool **m\_convertDate**
- int32\_t **m\_currentPos**
- coda\_Cursor **m\_cursor**
- **CDate** **m\_dateRef**
- std::string **m\_description**
- long **m\_dim** [MAX\_NUM\_DIMS]
- bool **m\_dimsTransposed**
- bool **m\_expandArray**
- bool **m\_fieldHasDefaultValue**
- **CObArray** \* **m\_fieldIndexes**
- std::string **m\_fullName**
- bool **m\_goToAvailableUnionField**
- bool **m\_hidden**
- bool **m\_highResolution**
- int32\_t **m\_index**
- bool **m\_isFixedSize**
- int32\_t **m\_isUnion**
- std::string **m\_key**
- int32\_t **m\_maxPos**
- bool **m\_metaData**
- std::string **m\_name**
- coda\_native\_type **m\_nativeType**
- int32\_t **m\_nbDims**

- uint32\_t **m\_numHighResolutionMeasure**
- double **m\_offset**
- std::string **m\_recordName**
- coda\_special\_type **m\_specialType**
- bool **m\_toBeRemoved**
- coda\_type\_class **m\_typeClass**
- std::string **m\_unit**
- bool **m\_unitsDate**
- double **m\_validMax**
- double **m\_validMin**
- bool **m\_virtualField**

#### 8.43.1 Detailed Description

Field management base classe.

Version

1.0

#### 8.43.2 Member Data Documentation

8.43.2.1 long brathl::CField::m\_dim[MAX\_NUM\_DIMS] [protected]

total number of dimensions

8.43.2.2 bool brathl::CField::m\_isFixedSize [protected]

(maximum) dimensions

8.43.2.3 double brathl::CField::m\_validMax [protected]

Valid max value

8.43.2.4 double brathl::CField::m\_validMin [protected]

Valid min value

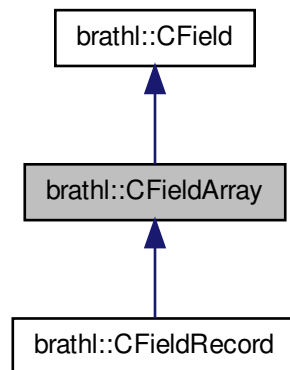
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

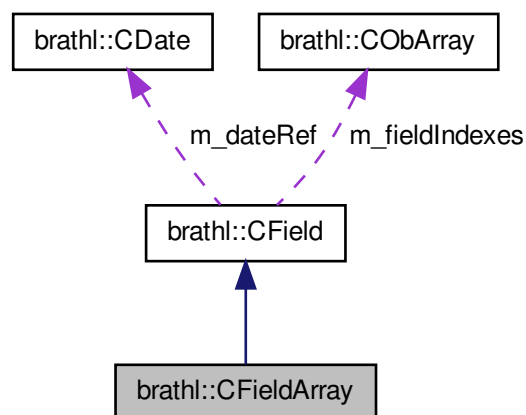
## 8.44 brathl::CFieldArray Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldArray:



Collaboration diagram for brathl::CFieldArray:



#### Public Member Functions

- **CFieldArray** ()  
*Ctor.*
- **CFieldArray** (const std::string &name, const std::string &description="", const std::string &unit="")
- **CFieldArray** (int32\_t nbDims, const long dim[], const std::string &name, const std::string &description="", const std::string &unit="")
- **CFieldArray** (CFieldArray &f)
- void **CreateFieldIndexes** (CObArray &vect)
- virtual **CFieldSet** \* **CreateFieldSet** (const CField::CListField &listFields) override
- virtual void **Dump** (std::ostream &fOut=std::cerr) override

*Dump function.*

- virtual void **DumpFieldDictionary** (std::ostream &fOut=std::cout) override
- virtual uint32\_t **GetOffsetDim** () override
- virtual int32\_t **GetVirtualNbDims** () override
- const **CFieldArray** & **operator=** (**CFieldArray** &f)
- virtual void **PopCursor** () override
- virtual void **PushPos** () override
- virtual void **PushPos** (int32\_t iDim)
- virtual void **Read** (CDoubleArray &vect, bool skip=false) override
- virtual void **Read** (double \*data, bool skip=false) override
- void **Set** (**CFieldArray** &f)
- virtual ~**CFieldArray** ()

*Dtor.*

#### Additional Inherited Members

##### 8.44.1 Detailed Description

Field of type 'array" management classes.

#### Version

1.0

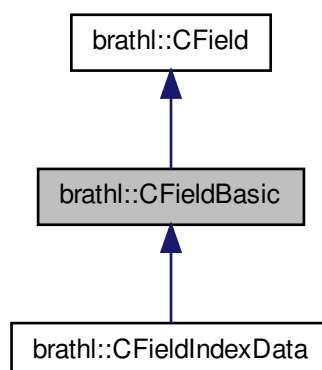
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

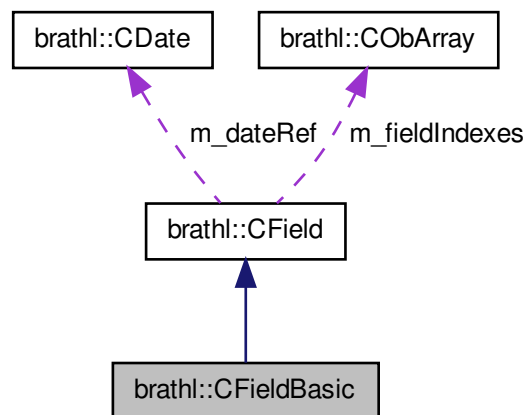
## 8.45 brathl::CFieldBasic Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldBasic:



Collaboration diagram for brathl::CFieldBasic:



#### Public Member Functions

- **CFieldBasic** ()  
*Ctor.*
- **CFieldBasic** (long length, const std::string &name, const std::string &description, const std::string &unit)
- **CFieldBasic** (CFieldBasic &f)
- virtual **CFieldSet** \* **CreateFieldSet** (const CField::CListField &listFields)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **DumpFieldDictionary** (std::ostream &fOut=std::cout)
- const **CFieldBasic** & **operator=** (CFieldBasic &f)
- virtual void **PopCursor** ()
- virtual void **PushPos** ()
- virtual void **Read** (CDoubleArray &vect, bool skip=false)
- virtual void **Read** (double \*data, bool skip=false)
- virtual void **Read** (std::string &data, bool skip=false)
- void **Set** (CFieldBasic &f)
- virtual ~**CFieldBasic** ()  
*Dtor.*

#### Public Attributes

- long **m\_length**

#### Additional Inherited Members

##### 8.45.1 Detailed Description

Field of type 'basic' management classes.

Version

1.0

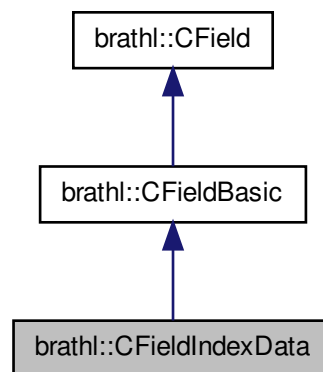
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

## 8.46 brathl::CFieldIndexData Class Reference

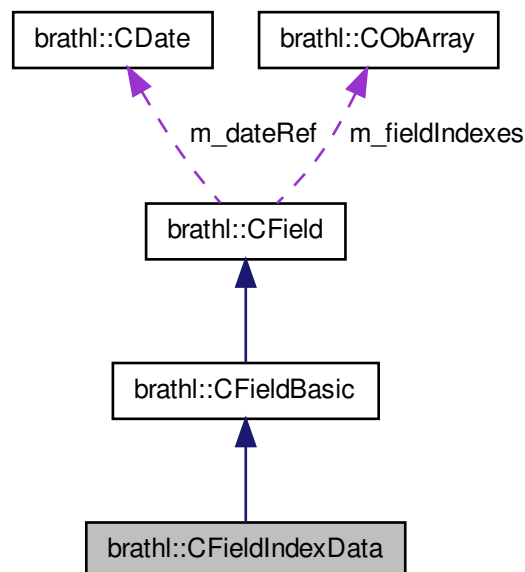
```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldIndexData:





Collaboration diagram for brathl::CFieldIndexData:



#### Public Member Functions

- **CFieldIndexData** ()  
*Ctor.*
- **CFieldIndexData** (const std::string &name, const std::string &description, const std::string &unit="")
- **CFieldIndexData** (CFieldIndexData &f)
- virtual **CFieldSet** \* **CreateFieldSet** (const **CField::CListField** &listFields)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **DumpFieldDictionary** (std::ostream &fOut=std::cout)
- double **GetValue** ()
- const **CFieldIndexData** & **operator=** (CFieldIndexData &f)
- virtual void **PopCursor** ()
- virtual void **PushPos** ()
- virtual void **Read** (CDoubleArray &vect, bool skip=false)
- virtual void **Read** (double \*data, bool skip=false)
- virtual void **Read** (std::string &data, bool skip=false)
- virtual void **Read** (double &value)
- virtual double **Read** ()
- void **Set** (CFieldIndexData &f)
- virtual ~**CFieldIndexData** ()  
*Dtor.*

#### Protected Member Functions

- void **Init** ()

## Additional Inherited Members

## 8.46.1 Detailed Description

Field of type 'basic' management classes.

## Version

1.0

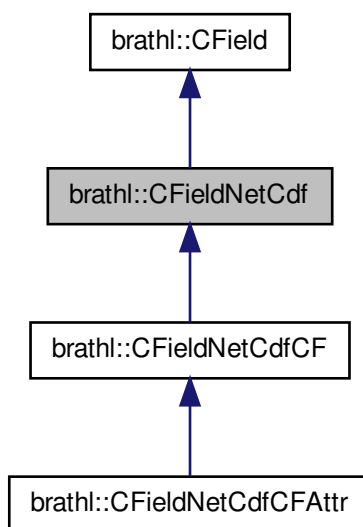
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

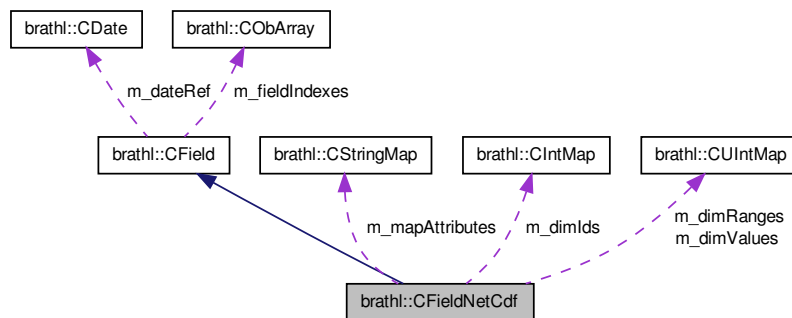
## 8.47 brathl::CFieldNetCdf Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldNetCdf:



Collaboration diagram for brathl::CFieldNetCdf:



### Public Member Functions

- void **AdjustValidMinMaxFromValues** ()
- **CFieldNetCdf** ()  
*Ctor.*
- **CFieldNetCdf** (const std::string &name, const std::string &description="", const std::string &unit="", int32\_t netCdfId=NC\_GLOBAL, int32\_t type=NC\_NAT, const CUIntArray \*dimValues=NULL, const CStringArray \*dimNames=NULL, const CIntArray \*dimIds=NULL, const CDoubleArray \*values=NULL)
- **CFieldNetCdf** (CFieldNetCdf &f)
- virtual CBratObject \* **Clone** ()
- **CFieldNetCdf** \* **CloneThis** ()
- virtual CFieldSet \* **CreateFieldSet** (const CField::CListField &listFields)
- virtual CFieldSet \* **CreateFieldSet** ()
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **DumpFieldDictionary** (std::ostream &fOut=std::cout)
- void **EmptyValues** ()
- double **GetAddOffset** ()
- virtual std::string **GetAttribute** (const std::string attrName)
- const CStringMap & **GetAttributes** ()
- int32\_t **GetCounFromDimCountArray** ()
- const CIntMap & **GetDimIds** ()
- void **GetDimIdsAsArray** (CIntArray &values, bool bRemoveAll=true)
- const CStringArray & **GetDimNames** ()
- uint32\_t **GetDimRange** (const std::string &dimName)
- const CUIntMap & **GetDimRanges** ()
- uint32\_t \* **GetDimsCountArray** ()
- uint32\_t \* **GetDimsIndexArray** ()
- const CUIntMap & **GetDimValues** ()
- void **GetDimValuesAsArray** (CUIntArray &values, bool bRemoveAll=true)
- double **GetFillValue** ()
- virtual std::string **GetFullName** ()
- virtual std::string **GetFullNameWithRecord** ()
- virtual std::string **GetMostExplicitName** ()
- int32\_t **GetNativeType** ()
- virtual std::string **GetNativeTypeName** ()
- int32\_t **GetNetCdfId** ()

- CUnit \* **GetNetCdfUnit** ()
- int32\_t **GetPosFromDimIndexArray** ()
- virtual std::string **GetRecordName** ()
- double **GetScaleFactor** ()
- int32\_t **GetSpecialType** ()
- virtual std::string **GetSpecialTypeName** ()
- int32\_t **GetType** ()
- virtual std::string **GetTypeName** ()
- virtual CDoubleArray & **GetValues** ()
- double \* **GetValuesAsArray** ()
- virtual CDoubleArray & **GetValuesWithUnitConversion** (const std::string &wantedUnit)
- virtual int32\_t **GetVirtualNbDims** ()
- virtual void **InitDimIndexes** (uint32\_t value)
- virtual void **InitDimsIndexToMax** ()
- virtual void **InitDimsIndexToMax** (uint32\_t index)
- bool **IsAtBeginning** ()
- virtual bool **IsSpecialType** ()
- uint32\_t \* **NewDimIndexArray** (CFieldNetCdf \*fromField=NULL)
- bool **NextIndex** ()
- const CFieldNetCdf & **operator=** (CFieldNetCdf &f)
- virtual void **PopCursor** ()
- bool **PrevIndex** ()
- virtual void **PushPos** ()
- virtual void **Read** (CDoubleArray &vect, bool skip=false)
- virtual void **Read** (CExpressionValue &value, bool skip=false)
- NetCDFVarKind **SearchDimKind** ()
- void **Set** (CFieldNetCdf &f)
- void **SetAddOffset** (double value)
- void **SetAtBeginning** (bool value)
- virtual void **SetAttributes** (const CStringMap &mapAttributes)
- virtual void **SetAttributes** (const CStringMap \*mapAttributes)
- void **SetDimIds** (const CIntMap &dimIds)
- void **SetDimIds** (const CIntMap \*dimIds)
- virtual void **SetDimInfo** (const CStringArray &dimNames, const CIntArray &dimIds, const CUIntArray &dimValues)
- virtual void **SetDimInfo** (const CStringArray \*dimNames, const CIntArray \*dimIds, const CUIntArray \*dimValues)
- virtual void **SetDimNames** (const CStringArray &dimNames)
- virtual void **SetDimNames** (const CStringArray \*dimNames)
- virtual void **SetDimValues** (const CUIntMap &dimValues)
- virtual void **SetDimValues** (const CUIntMap \*dimValues)
- void **SetFillValue** (double value)
- virtual void **SetIndex** (const std::string &dimName, uint32\_t index, uint32\_t count)
- void **SetNativeType** (int32\_t type)
- void **SetNetCdfId** (int32\_t id)
- void **SetScaleFactor** (double value)
- virtual void **SetType** (int32\_t type)
- virtual void **SetUnit** (const std::string &unit)
- virtual void **SetUnit** (const CUnit &unit)
- virtual void **SetValues** (double values)
- virtual void **SetValues** (double \*values, size\_t length)
- virtual void **SetValues** (const CDoubleArray &values)
- virtual void **SetValues** (const CDoubleArray \*values)
- virtual void **SetValues** (const CInt16Array &values)
- virtual void **SetValues** (const CInt16Array \*values)

- virtual void **SetValues** (const CInt8Array &values)
- virtual void **SetValues** (const CInt8Array \*values)
- virtual void **SetValues** (const CIntArray &values)
- virtual void **SetValues** (const CIntArray \*values)
- virtual void **SetValues** (const CUInt8Array &values)
- virtual void **SetValues** (const CUInt8Array \*values)
- virtual void **SetValues** (const CFloatArray &values)
- virtual void **SetValues** (const CFloatArray \*values)
- virtual void **SetValues** (const std::string &values)
- void **SetValuesAsArray** ()
- void **SetValuesAsArray** (const CDoubleArray &values)
- void **SetValuesAsArray** (const CDoubleArray \*values)
- virtual  $\sim$ **CFieldNetCdf** ()

*Dtor.*

#### Protected Member Functions

- void **DeleteDimIndexArray** ()
- void **DeleteValuesAsArray** ()
- void **Init** ()

#### Protected Attributes

- double **m\_addOffset**
- bool **m\_atBeginning**
- CIntMap **m\_dimIds**
- CStringArray **m\_dimNames**
- CUIntMap **m\_dimRanges**
- uint32\_t \* **m\_dimsCountArray**
- uint32\_t \* **m\_dimsIndexArray**
- CUIntMap **m\_dimValues**
- double **m\_fillValue**
- CStringMap **m\_mapAttributes**
- int32\_t **m\_netCdfId**
- CUnit **m\_netCdfUnit**
- double **m\_scaleFactor**
- int32\_t **m\_type**
- CDoubleArray **m\_values**
- double \* **m\_valuesAsArray**
- CDoubleArray **m\_valuesWithUnitConversion**

#### Additional Inherited Members

##### 8.47.1 Detailed Description

Field from a NetCdf file management classes.

#### Version

1.0

### 8.47.2 Member Data Documentation

#### 8.47.2.1 double brathl::CFieldNetCdf::m\_addOffset [protected]

data add offset

Referenced by Dump().

#### 8.47.2.2 bool brathl::CFieldNetCdf::m\_atBeginning [protected]

'At beginning" flag

Referenced by Dump().

#### 8.47.2.3 CIntMap brathl::CFieldNetCdf::m\_dimIds [protected]

Map of the dimension's ids of the field (key is dim. name)

Referenced by Dump().

#### 8.47.2.4 CStringArray brathl::CFieldNetCdf::m\_dimNames [protected]

Array of the dimension's names of the field (index is dim. range)

Referenced by Dump().

#### 8.47.2.5 CUIntMap brathl::CFieldNetCdf::m\_dimRanges [protected]

Map of the dimension's range of the field (key is dim. name)

Referenced by Dump().

#### 8.47.2.6 uint32\_t\* brathl::CFieldNetCdf::m\_dimsCountArray [protected]

Array of the dimension count for reading

Referenced by Dump().

#### 8.47.2.7 uint32\_t\* brathl::CFieldNetCdf::m\_dimsIndexArray [protected]

Array of the dimension's index

Referenced by Dump().

#### 8.47.2.8 CUIntMap brathl::CFieldNetCdf::m\_dimValues [protected]

Map of the dimension's values of the field (key is dim. name)

Referenced by Dump().

#### 8.47.2.9 double brathl::CFieldNetCdf::m\_fillValue [protected]

data default value (fill value)

Referenced by Dump().

#### 8.47.2.10 CStringMap brathl::CFieldNetCdf::m\_mapAttributes [protected]

Map of the netcdf attributes (as std::string representation).

Referenced by Dump().

#### 8.47.2.11 int32\_t brathl::CFieldNetCdf::m\_netCdfId [protected]

The netcdf external id

Referenced by Dump().

**8.47.2.12** CUnit bratl::CFieldNetCdf::m\_netCdfUnit [protected]

The netcdf unit

Referenced by Dump().

**8.47.2.13** double bratl::CFieldNetCdf::m\_scaleFactor [protected]

data scale factor

Referenced by Dump().

**8.47.2.14** int32\_t bratl::CFieldNetCdf::m\_type [protected]

The netcdf external data types

Referenced by Dump().

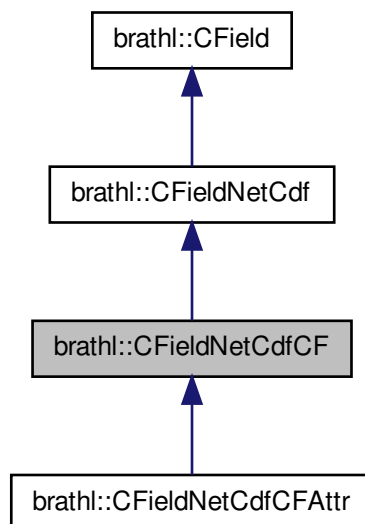
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

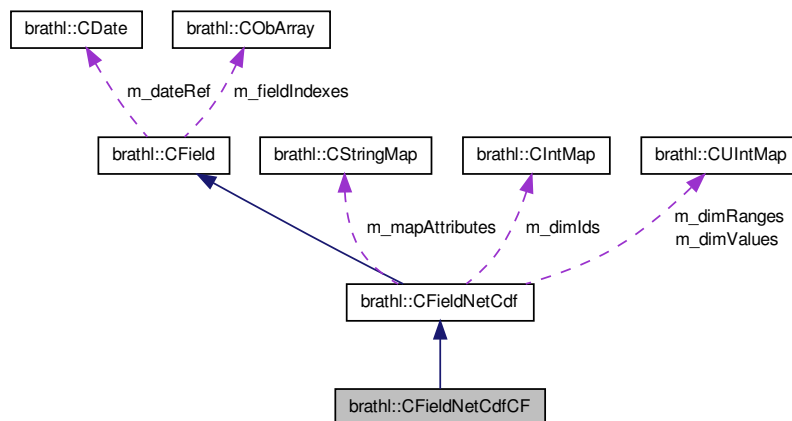
**8.48** bratl::CFieldNetCdfCF Class Reference

```
#include <Field.h>
```

Inheritance diagram for bratl::CFieldNetCdfCF:



Collaboration diagram for brathl::CFieldNetCdfCF:



#### Public Member Functions

- **CFieldNetCdfCF** ()  
*Ctor.*
- **CFieldNetCdfCF** (const std::string &name, const std::string &description="", const std::string &unit="", int32\_t netCdfId=NC\_GLOBAL, int32\_t type=NC\_NAT, const CUIntArray \*dimValues=NULL, const CStringArray \*dimNames=NULL, const CIntArray \*dimIds=NULL, const CDoubleArray \*values=NULL)
- **CFieldNetCdfCF** (**CFieldNetCdfCF** &f)
- virtual CBratObject \* **Clone** ()
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **DumpFieldDictionary** (std::ostream &fOut=std::cout)
- virtual std::string **GetDimAsString** ()
- std::string **GetDimAsStringWithIndexes** ()
- std::string **GetDimAsStringWithNames** ()
- const **CFieldNetCdfCF** & **operator=** (**CFieldNetCdfCF** &f)
- void **Set** (**CFieldNetCdfCF** &f)
- virtual ~**CFieldNetCdfCF** ()  
*Dtor.*

#### Protected Member Functions

- void **Init** ()

#### Additional Inherited Members

##### 8.48.1 Detailed Description

Field from a NetCdf file management classes.



Version

1.0

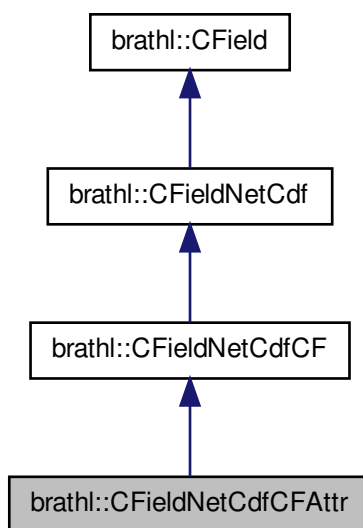
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

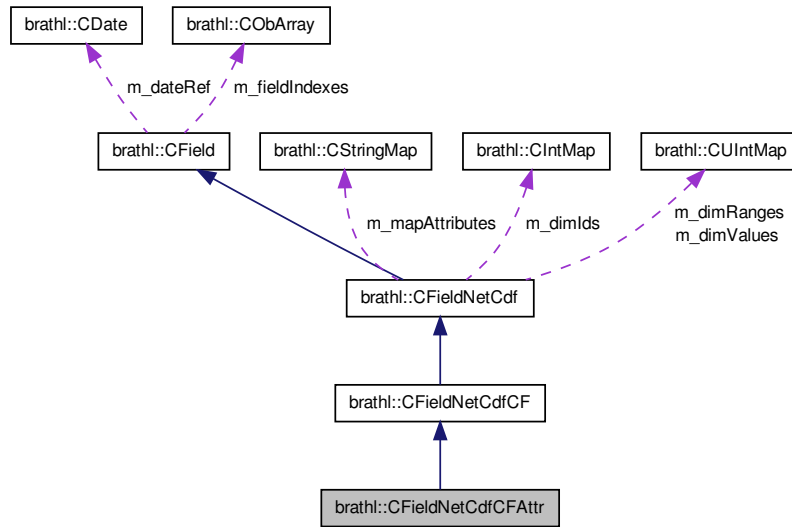
## 8.49 brathl::CFieldNetCdfCFAttr Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldNetCdfCFAttr:



Collaboration diagram for brathl::CFieldNetCdfCFAAttr:



#### Public Member Functions

- **CFieldNetCdfCFAAttr** ()

*Ctor.*

- **CFieldNetCdfCFAAttr** (CNetCDFVarDef \*netCDFVarDef, CNetCDFAttr \*netCDFAttr)
  - **CFieldNetCdfCFAAttr** (CNetCDFAttr \*netCDFAttr)
  - **CFieldNetCdfCFAAttr** (CFieldNetCdfCFAAttr &f)
  - virtual CBratObject \* **Clone** ()
  - **CFieldNetCdfCFAAttr** \* **CloneThis** ()
  - void **DeleteNetCDFAttr** ()
  - virtual void **Dump** (std::ostream &fOut=std::cerr)
- Dump fonction.*
- virtual void **DumpFieldDictionary** (std::ostream &fOut=std::cout)
  - virtual std::string **GetMostExplicitName** ()
  - CNetCDFAttr \* **GetNetCDFAttr** ()
  - const std::string & **GetRelatedVarName** ()
  - bool **IsFieldNetCdfCFAAttrGlobal** ()
  - bool **IsFieldNetCdfCFAAttrVariable** ()
  - const **CFieldNetCdfCFAAttr** & **operator=** (**CFieldNetCdfCFAAttr** &f)
  - void **Set** (**CFieldNetCdfCFAAttr** &f)
  - virtual void **SetAttributes** (const **CStringMap** &mapAttributes)
  - virtual void **SetAttributes** (const **CStringMap** \*mapAttributes)
  - void **SetInfoFromAttr** (CNetCDFVarDef \*netCDFVarDef=NULL)
  - void **SetInfoFromAttr** (CNetCDFAttr \*netCDFAttr, CNetCDFVarDef \*netCDFVarDef=NULL)
  - void **SetNetCDFAttr** (CNetCDFAttr \*value)
  - void **SetRelatedVarName** (const std::string &value)
  - virtual void **SetType** (int32\_t type)
  - void **SetValuesFromAttr** ()
  - void **SetValuesFromAttr** (CNetCDFAttr \*netCDFAttr)
  - virtual ~**CFieldNetCdfCFAAttr** ()

*Dtor.*

## Static Public Member Functions

- static bool **IsFieldNetCdfCFAttrGlobal** (CBratObject \*ob)
- static bool **IsFieldNetCdfCFAttrVariable** (CBratObject \*ob)

## Protected Member Functions

- void **Init** ()

## Protected Attributes

- CNetCDFAttr \* **m\_netCDFAttr**
- std::string **m\_relatedVarName**

## Additional Inherited Members

## 8.49.1 Detailed Description

Field from a NetCdf Attribute file management classes.

## Version

1.0

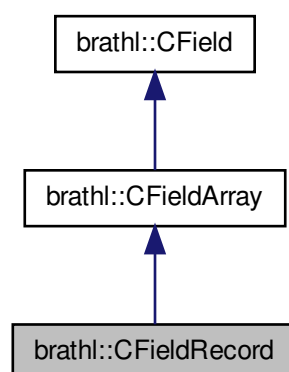
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

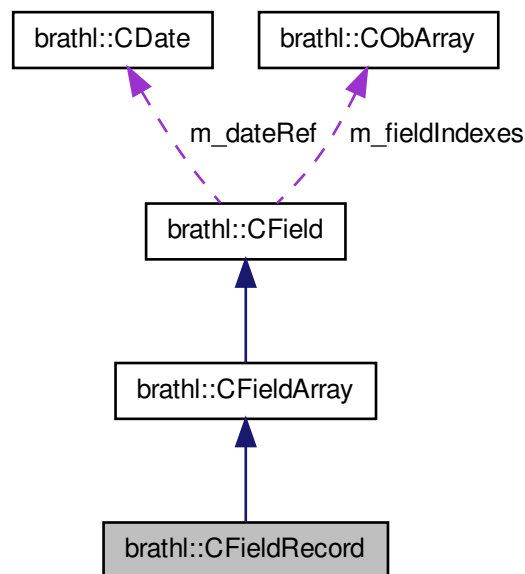
## 8.50 brathl::CFieldRecord Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldRecord:



Collaboration diagram for brathl::CFieldRecord:



#### Public Member Functions

- **CFieldRecord** ()  
*Ctor.*
- **CFieldRecord** (size\_t nbFields, const std::string &name, const std::string &description="", const std::string &unit="")
- **CFieldRecord** (int32\_t nbDims, const long dim[], size\_t nbFields, const std::string &name, const std::string &description="", const std::string &unit="")
- **CFieldRecord** (CFieldRecord &f)
- virtual **CFieldSet** \* **CreateFieldSet** (const CField::CListField &listFields)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **DumpFieldDictionary** (std::ostream &fOut=std::cout)
- size\_t **GetNbFields** ()
- virtual int32\_t **GetVirtualNbDims** ()
- const **CFieldRecord** & **operator=** (CFieldRecord &f)
- virtual void **PopCursor** ()
- virtual void **PushPos** ()
- virtual void **PushPos** (int32\_t iDim)
- virtual void **Read** (CDoubleArray &vect, bool skip=false)
- virtual void **Read** (double \*data, bool skip=false)
- void **Set** (CFieldRecord &f)
- void **SetNbFields** (size\_t value)
- virtual ~**CFieldRecord** ()  
*Dtor.*

## Protected Attributes

- `size_t m_nbFields`

## Additional Inherited Members

## 8.50.1 Detailed Description

Field of type 'record' management classes.

## Version

1.0

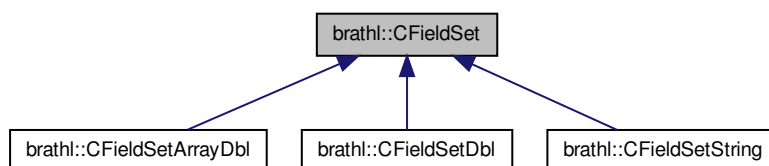
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

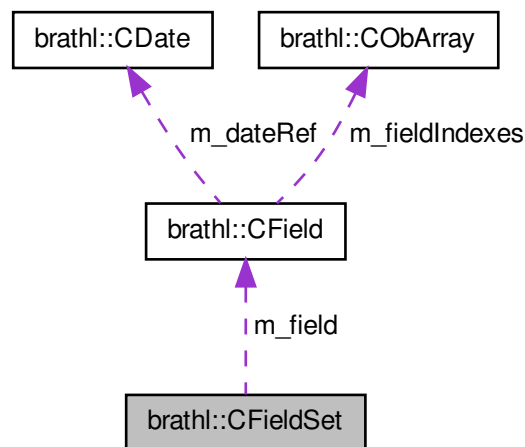
## 8.51 brathl::CFieldSet Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldSet:



Collaboration diagram for brathl::CFieldSet:



#### Public Member Functions

- **CFieldSet** (const std::string &name="")  
*Ctor.*
- **CFieldSet** (CFieldSet &f)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual **CField** \* **GetField** ()
- const std::string & **GetName** ()
- virtual void **Insert** (const CDoubleArray &vect, bool bRemove=false)=0
- virtual void **Insert** (double value, bool bRemove=false)=0
- virtual void **Insert** (const std::string &value, bool bRemove=false)=0
- **CFieldSet** & **operator=** (CFieldSet &o)
- virtual void **SetField** (CField \*value)
- virtual ~**CFieldSet** ()  
*Dtor.*

#### Protected Member Functions

- void **Copy** (CFieldSet &f)

#### Protected Attributes

- **CField** \* **m\_field**
- std::string **m\_name**

### 8.51.1 Detailed Description

a base class for set of field value.

#### Version

1.0

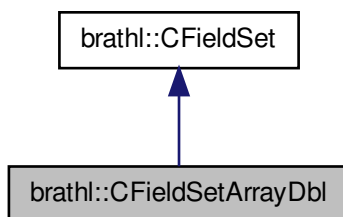
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

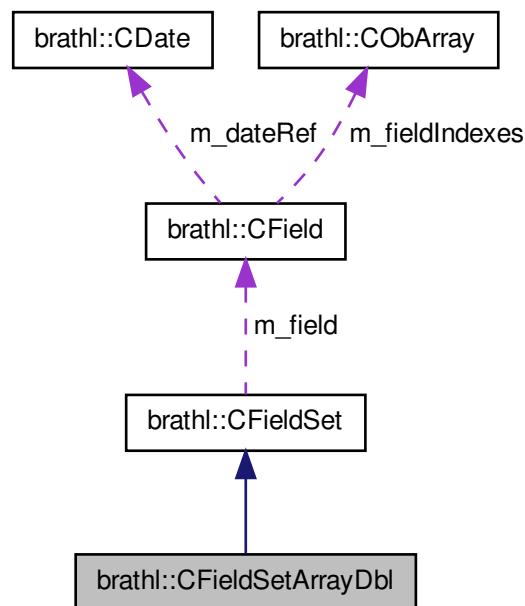
## 8.52 brathl::CFieldSetArrayDbI Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldSetArrayDbI:



Collaboration diagram for brathl::CFieldSetArrayDbI:



#### Public Member Functions

- **CFieldSetArrayDbI** (const std::string &name="")  
*Ctor.*
- **CFieldSetArrayDbI** (CFieldSetArrayDbI &f)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- CDoubleArray & **GetDataVector** ()
- virtual void **Insert** (const CDoubleArray &vect, bool bRemove=false)
- virtual void **Insert** (double value, bool bRemove=false)
- virtual void **Insert** (const std::string &value, bool bRemove=false)
- **CFieldSetArrayDbI & operator=** (CFieldSetArrayDbI &o)
- virtual ~**CFieldSetArrayDbI** ()  
*Dtor.*

#### Public Attributes

- CUIntArray **m\_dim**
- int32\_t **m\_nbDims**
- CDoubleArray **m\_vector**

#### Protected Member Functions

- void **Copy** (CFieldSetArrayDbI &f)



#### Additional Inherited Members

##### 8.52.1 Detailed Description

a set of double array field value.

#### Version

1.0

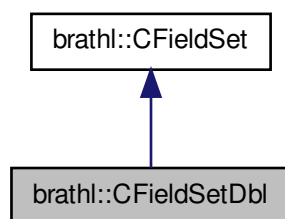
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

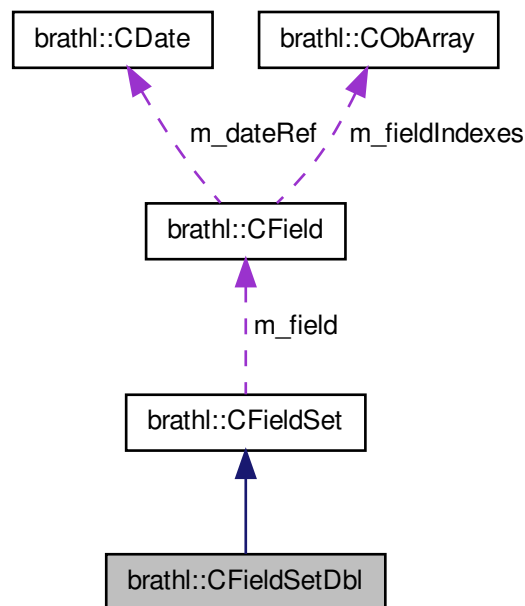
### 8.53 brathl::CFieldSetDbI Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CFieldSetDbI:



Collaboration diagram for brathl::CFieldSetDbI:



#### Public Member Functions

- `int32_t AsInt32 ()`
- `int32_t AsUInt32 ()`
- `CFieldSetDbI (const std::string &name="")`  
*Ctor.*
- `CFieldSetDbI (CFieldSetDbI &f)`
- `virtual void Dump (std::ostream &fOut=std::cerr)`  
*Dump fonction.*
- `double GetData ()`
- `double & GetDataRef ()`
- `virtual void Insert (const CDoubleArray &vect, bool bRemove=false)`
- `virtual void Insert (double value, bool bRemove=false)`
- `virtual void Insert (const std::string &value, bool bRemove=false)`
- `CFieldSetDbI & operator= (CFieldSetDbI &o)`
- `void SetData (double value)`
- `virtual ~CFieldSetDbI ()`  
*Dtor.*

#### Public Attributes

- `double m_value`

#### Protected Member Functions

- `void Copy (CFieldSetDbI &f)`

#### Additional Inherited Members

##### 8.53.1 Detailed Description

a set of double field value.

#### Version

1.0

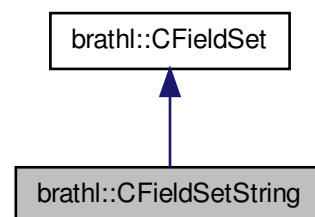
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

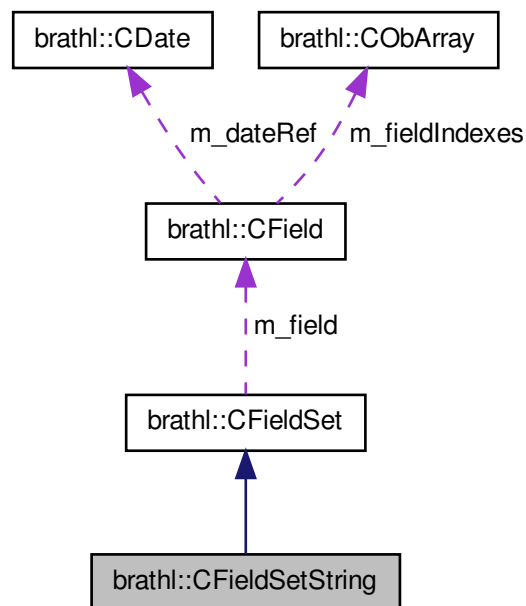
## 8.54 bratl::CFieldSetString Class Reference

```
#include <Field.h>
```

Inheritance diagram for bratl::CFieldSetString:



Collaboration diagram for brathl::CFieldSetString:



#### Public Member Functions

- **CFieldSetString** (const std::string &name="")  
*Ctor.*
- **CFieldSetString** (CFieldSetString &f)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- std::string **GetData** ()
- std::string & **GetDataRef** ()
- virtual void **Insert** (const CDoubleArray &vect, bool bRemove=false)
- virtual void **Insert** (double value, bool bRemove=false)
- virtual void **Insert** (const std::string &value, bool bRemove=false)
- **CFieldSetString & operator=** (CFieldSetString &o)
- void **SetData** (const std::string &value)
- virtual ~**CFieldSetString** ()  
*Dtor.*

#### Public Attributes

- std::string **m\_value**

#### Protected Member Functions

- void **Copy** (CFieldSetString &f)

## Additional Inherited Members

## 8.54.1 Detailed Description

a set of std::string field value.

## Version

1.0

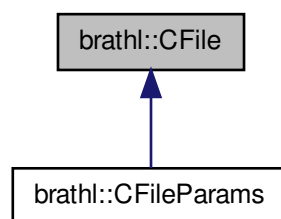
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

## 8.55 brathl::CFile Class Reference

```
#include <File.h>
```

Inheritance diagram for brathl::CFile:



## Public Types

- enum **openFlags** {  
**modeRead** = 0x0001, **modeWrite** = 0x0002, **modeAppend** = 0x0004, **modeReadWrite** = 0x0008,  
**modeRWCreate** = 0x0010, **modeReadAppend** = 0x0020, **typeText** = 0x4000, **typeBinary** = static\_  
cast<int32\_t>(0x8000) }

## Public Member Functions

- **CFile** ()  
*Empty **CFile** (p. 235) ctor.*
- **CFile** (const std::string &name, uint32\_t mode=**modeRead**|**typeBinary**)
- bool **Close** ()
- bool **Delete** ()
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Gets the las error message encountered.*
- bool **Duplicate** (const std::string &newFileName)
- void **Flush** ()
- const std::string & **GetFileName** ()

- long **GetLength** ()  
*Returns the current length of the file.*
- uint32\_t **GetMode** ()
- long **GetPosition** ()  
*Returns the current position of the file pointer.*
- bool **GetStatus** (struct stat &fileStatus)
- bool **IsOpen** ()
- bool **Open** (const std::string &name, uint32\_t mode=**modeRead**|**typeBinary**)
- bool **Open** ()
- int32\_t **ReadLineData** (char \*lineRead, uint32\_t size)
- int32\_t **ReadToBuffer** (char \*destinationBuffer, uint32\_t numBytesToRead=CFile::m\_maxBufferToRead)
- bool **Rename** (const std::string &newName)
- bool **SeekToBegin** ()
- bool **SeekToEnd** ()
- bool **SetBufferingMode** (bool mode=true)
- bool **SetPosition** (long positionOffset)
- bool **Write** (const int character)
- bool **Write** (const std::string &str)
- bool **Write** (const char \*str)
- bool **WriteChar** (const int character)
- uint32\_t **WriteFromBuffer** (const char \*sourceBuffer, uint32\_t sourceBufferLength)
- bool **WriteString** (const char \*str)
- virtual ~**CFile** ()  
*Destructor.*

#### Static Public Member Functions

- static bool **Delete** (const std::string &filename)
- static bool **GetStatus** (const std::string &filename, struct stat &fileStatus)
- static bool **Rename** (const std::string &oldName, const std::string &newName)

#### Protected Attributes

- char **m\_lastError** [**BRATHL\_MAX\_ERRMSG\_LEN**+1]  
*last error message*

#### 8.55.1 Detailed Description

File management class.

This class provides unbuffered, binary and ascii disk input/output services.

While managing the file, if an error occurred, a CFileException is raised.

#### Version

1.0

## 8.55.2 Member Enumeration Documentation

## 8.55.2.1 enum brathl::CFile::openFlags

File access mode enumeration: Flags can be combined by using the bitwise-OR (|) operator

Enumerator:

**modeRead** Opens for reading. If the file does not exist or cannot be found, open fails.

**modeWrite** Opens an empty file for writing. If the given file exists, its contents are destroyed.

**modeAppend** Opens for writing at the end of the file (appending) without removing the EOF marker before writing new data to the file; creates the file first if it doesn't exist.

**modeReadWrite** Opens for both reading and writing. (The file must exist.)

**modeRWCreate** Opens an empty file for both reading and writing. If the given file exists, its contents are destroyed.

**modeReadAppend** Opens for reading and appending; the appending operation includes the removal of the EOF marker before new data is written to the file and the EOF marker is restored after writing is complete; creates the file first if it doesn't exist.

**typeText** Open in text (translated) mode.

**typeBinary** Open in binary (untranslated) mode.

## 8.55.3 Constructor &amp; Destructor Documentation

## 8.55.3.1 brathl::CFile::CFile ( const std::string &amp; name, uint32\_t mode = modeRead|typeBinary )

Creates new **CFile** (p. 235) object and opens the file. If an error occurred, a **CFileException** is raised.

Parameters

<i>name</i>	[in] : full name of the file;
<i>mode</i>	[in] : access mode - default value : modeRead typeBinary (see <b>openFlags</b> (p. 237));

## 8.55.4 Member Function Documentation

## 8.55.4.1 bool brathl::CFile::Close ( )

Closes file object. **IsOpen()** (p. 239) and **Open()** (p. 239) are the only functions available just after this operation.

Returns

true on success, otherwise false

Referenced by brathl::CFileParams::Load(), and brathl::CMission::LoadAliasName().

## 8.55.4.2 bool brathl::CFile::Delete ( )

Closes file object and deletes (removes) the file. **IsOpen()** (p. 239) and **Open()** (p. 239) are the only functions available just after this operation.

Returns

true on success, otherwise false

## 8.55.4.3 bool brathl::CFile::Delete ( const std::string &amp; filename ) [static]

Deletes (removes) a file.

## Parameters

<i>filename</i>	[in] : file to delete/remove <b>IsOpen()</b> (p. 239) and <b>Open()</b> (p. 239) are the only functions available just after this operation.
-----------------	--

## Returns

true on success, otherwise false

**8.55.4.4** void brathl::CFile::Dump ( std::ostream & *fOut* = std::cerr ) [virtual]

Gets the las error message encountered.

Dump fonction

Reimplemented in **brathl::CFileParams** (p. 243).

**8.55.4.5** bool brathl::CFile::Duplicate ( const std::string & *newFileName* )

Creates a copy of current file with the newFileName. If file with specified filename exists, it's contents are erased.

## Parameters

<i>newFileName</i>	[in] : copy to file name
--------------------	--------------------------

## Returns

true on success, otherwise false

References IsOpen(), and WriteFromBuffer().

**8.55.4.6** const std::string & brathl::CFile::GetFileName ( )

Gets the name of the file

**8.55.4.7** uint32\_t brathl::CFile::GetMode ( )

Gets the name of the file

**8.55.4.8** bool brathl::CFile::GetStatus ( struct stat & *fileStatus* )

Gets information about the file.

## Parameters

<i>fileStatus</i>	[in] : structure to store results
-------------------	-----------------------------------

## Returns

true on success, otherwise false

**8.55.4.9** bool brathl::CFile::GetStatus ( const std::string & *filename*, struct stat & *fileStatus* ) [static]

Gets information about a file.

## Parameters

<i>filename</i>	[in] : file to get the status
<i>fileStatus</i>	[in] : structure to store results



**Returns**

true on success, otherwise false

References Open().

**8.55.4.10 bool brathl::CFile::IsOpen ( )**

Tests if file is opened or not

**Returns**

true if opened, false otherwise

Referenced by Duplicate(), brathl::CFileParams::Load(), and brathl::CMission::LoadAliasName().

**8.55.4.11 bool brathl::CFile::Open ( const std::string & name, uint32\_t mode = modeRead|typeBinary )**

Opens a file. If file object is open, it is closed. If an error occurred, a CFileException is raised.

**Parameters**

<i>name</i>	[in] : full name of the file;
<i>mode</i>	[in] : access mode - default value : modeRead typeBinary (see <b>openFlags</b> (p. 237));

**Returns**

true on success, otherwise false

Referenced by GetStatus().

**8.55.4.12 bool brathl::CFile::Open ( )**

Opens the current file object. If an error occurred, a CFileException is raised.

**Returns**

true on success, otherwise false

References brathl::CTools::Format().

Referenced by brathl::CFileParams::Load().

**8.55.4.13 int32\_t brathl::CFile::ReadLineData ( char \* lineRead, uint32\_t size )**

Same as #ReadLine, but reads only line of data and skip comments and places contents into buffer pointed by lineRead. Comments start with character '#' anywhere in the line. Empty line or space line are also skipped If an error occurred, a CFileException is raised.

**Parameters**

<i>lineRead</i>	[out] : line data read
<i>size</i>	[in] : max number of bytes of the line

**Returns**

the number of bytes in the lineRead parameter. -1 if end of file reached

References brathl::CTools::Trim().

Referenced by brathl::CFileParams::Load(), and brathl::CMission::LoadAliasName().

**8.55.4.14** `int32_t brathl::CFile::ReadToBuffer ( char * destinationBuffer, uint32_t numBytesToRead = CFile::m_maxBufferToRead )`

Function reads 'NumBytesToRead' bytes from the current file position and places file contents into buffer pointed by destinationBuffer. If an error occurred, a CFileException is raised.

#### Parameters

<i>destinationBuffer</i>	[out] : destination buffer
<i>numBytesToRead</i>	[in] : number of bytes to reads

#### Returns

the number of bytes actually reads, zero if end of file reached

References brathl::CTools::Format().

**8.55.4.15** `bool brathl::CFile::Rename ( const std::string & newName )`

Renames file object. If file with specified filename exists, its contents are erased. The current file is closed, renamed and opened as new name.

#### Parameters

<i>newName</i>	[in] : new file name
----------------	----------------------

#### Returns

true on success, otherwise false

**8.55.4.16** `bool brathl::CFile::Rename ( const std::string & oldName, const std::string & newName ) [static]`

Renames a file. If file with specified filename exists, its contents are erased.

#### Parameters

<i>oldName</i>	[in] : file to rename
<i>newName</i>	[in] : new file name

#### Returns

true on success, otherwise false

**8.55.4.17** `bool brathl::CFile::SeekToBegin ( )`

Function moves file pointer to the beginning of file.

#### Returns

true on success, otherwise false

**8.55.4.18** `bool brathl::CFile::SeekToEnd ( )`

Function moves file pointer to the end of file.

#### Returns

true on success, otherwise false

**8.55.4.19** `bool brathl::CFile::SetBufferingMode ( bool mode = true )`

Change buffering mode. Function must be used before any read/write operation occurs!

**Parameters**

<i>mode</i>	[in] : true if buffered I/O (default), false if unbuffered I/O
-------------	--

**Returns**

true on success, otherwise false

**8.55.4.20** `bool brathl::CFile::SetPosition ( long positionOffset )`

Function moves file pointer by PositionOffset bytes relative to current position.

**Parameters**

<i>positionOffset</i>	[in] : offset to move
-----------------------	-----------------------

**Returns**

true on success, otherwise false

**8.55.4.21** `bool brathl::CFile::WriteChar ( const int character )`

Writes a single character to a file If an error occurred, a CFileException is raised.

**Parameters**

<i>character</i>	[in] : character to write
------------------	---------------------------

**Returns**

true on success, otherwise false

References brathl::CTools::Format().

**8.55.4.22** `uint32_t brathl::CFile::WriteFromBuffer ( const char * sourceBuffer, uint32_t sourceBufferLength )`

Writes data from memory to a file If an error occurred, a CFileException is raised.

**Parameters**

<i>sourceBuffer</i>	[in] : data to write
<i>sourceBufferLength</i>	[in] : data length to write

**Returns**

the number of bytes actually written.

References brathl::CTools::Format().

Referenced by Duplicate().

**8.55.4.23** `bool brathl::CFile::WriteString ( const char * str )`

Writes a std::string to a file If an error occurred, a CFileException is raised.

## Parameters

<i>str</i>	[in] : std::string to write
------------	-----------------------------

## Returns

true on success, otherwise false

References bratl::CTools::Format().

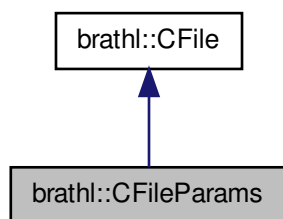
The documentation for this class was generated from the following files:

- File.h
- File.cpp

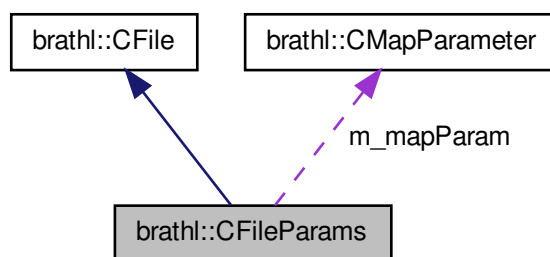
## 8.56 bratl::CFileParams Class Reference

```
#include <FileParams.h>
```

Inheritance diagram for bratl::CFileParams:



Collaboration diagram for bratl::CFileParams:



## Public Member Functions

- **CFileParams** ()

Empty **CFileParams** (p. 242) ctor.

- **CFileParams** (const std::string &name, uint32\_t mode=**modeRead|typeBinary**)
- unsigned **CheckCount** (const std::string &Key, int32\_t ValidMin=1, int32\_t ValidMax=1)
- virtual void **Dump** (std::ostream &fOut=std::cerr)

Dump function.

- void **GetFieldNames** (const std::string &key, CStringArray &fieldNames)
- **CStringMap** \* **GetFieldSpecificUnits** ()
- void **GetFileList** (const std::string &key, CStringArray &fileNames)
- std::string **GetFirstFile** (const std::string &key)
- bool **IsLoaded** ()
- void **Load** ()
- void **LoadAliases** ()
- void **LoadFieldSpecificUnits** ()
- void **SetVerboseLevel** ()
- void **SubstituteAliases** (const **CStringMap** &aliases)
- virtual ~**CFileParams** ()

Destructor.

- void **Load** (const std::string &name, uint32\_t mode=**modeRead|typeBinary**)

#### Public Attributes

- **CMapParameter** m\_mapParam

#### Additional Inherited Members

##### 8.56.1 Detailed Description

Parameters file management class.

This class provides ascii parameters file services

It makes it possible to acquire the whole of information which they contain

Parameters are described as 'keyword'='value'

keyword is character strings identifying a type of data. value is character strings associated with the key.

keyword and value have to be on the same line;

It don't make distinction between upper-case and lower-case letters.

While managing the file, if an error occurred, a CFileException is raised. While managing parameter (keyword, value), if an error occurred, a CParameterException is raised.

#### Version

1.0

##### 8.56.2 Constructor & Destructor Documentation

###### 8.56.2.1 brathl::CFileParams::CFileParams ( const std::string & name, uint32\_t mode = modeRead|typeBinary )

Creates new **CFileParams** (p. 242) object and opens the parameters file. On error, a CFileException or CParameterException exception is raised.

#### Parameters

<i>name</i>	[in] : full name of the file;
<i>mode</i>	[in] : access mode - default value : modeRead typeBinary (see <b>openFlags</b> (p. 237));

References Load().

### 8.56.3 Member Function Documentation

#### 8.56.3.1 unsigned brathl::CFileParams::CheckCount ( const std::string & *Key*, int32\_t *ValidMin* = 1, int32\_t *ValidMax* = 1 )

Throw an exception if the number of values is not valid.

##### Parameters

<i>ValidMin</i>	[in] : Minimal number of values
<i>ValidMax</i>	[in] : Maximal number of values. If <=0, it is considered as infinite. If < ValidMin, it is considered as equal to ValidMin.

##### Returns

actual number of occurrences of the parameter

References brathl::CParameter::Count(), brathl::CMapParameter::Exists(), brathl::CTools::Format(), and m\_mapParam.

Referenced by SetVerboseLevel().

#### 8.56.3.2 void brathl::CFileParams::Load ( )

Reads file parameters and load parameters On error, a CFileException or CParameterException exception is raised.

References brathl::CFile::Close(), brathl::CFile::GetLength(), brathl::CFile::IsOpen(), m\_mapParam, brathl::CFile::Open(), brathl::CFile::ReadLineData(), and brathl::CMapParameter::RemoveAll().

Referenced by CFileParams(), and Load().

#### 8.56.3.3 void brathl::CFileParams::Load ( const std::string & *name*, uint32\_t *mode* = modeRead|typeBinary )

Reads file parameters and load parameters On error, a CFileException or CParameterException exception is raised.

##### Parameters

<i>name</i>	[in] : full name of the file;
<i>mode</i>	[in] : access mode - default value : modeRead typeBinary (see <b>openFlags</b> (p. 237));

References Load(), and brathl::CFile::Open().

#### 8.56.3.4 void brathl::CFileParams::SetVerboseLevel ( )

Set the verbosity level from the standard keyword VERBOSE

References CheckCount(), and m\_mapParam.

### 8.56.4 Member Data Documentation

#### 8.56.4.1 CMapParameter brathl::CFileParams::m\_mapParam

A map containing all the parameters

Referenced by CheckCount(), Dump(), Load(), and SetVerboseLevel().

The documentation for this class was generated from the following files:

- FileParams.h
- FileParams.cpp

## 8.57 bratl::CProduct::CInfo Class Reference

```
#include <Product.h>
```

Inherits bratl::CBratObject.

### Public Attributes

- std::string **m\_fieldName**
- int32\_t **m\_index**
- int32\_t **m\_isUnion**
- coda\_Type \* **m\_type**
- coda\_type\_class **m\_type\_class**

### Additional Inherited Members

#### 8.57.1 Detailed Description

A class to traverse Brat files

### Version

1.0

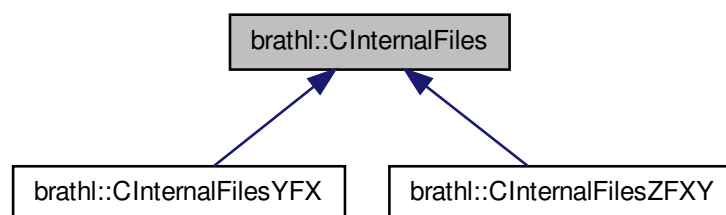
The documentation for this class was generated from the following files:

- Product.h
- Product.cpp

## 8.58 bratl::CInternalFiles Class Reference

```
#include <InternalFiles.h>
```

Inheritance diagram for bratl::CInternalFiles:



### Public Member Functions

- CNetCDFDimension \* **AddNetCDFDim** (CNetCDFDimension &dim, bool forceReplace=false)
- CNetCDFVarDef \* **AddNetCDFVarDef** (CNetCDFVarDef &var, bool forceReplace=false)
- **CInternalFiles** (std::string Name="", **bratl\_FileMode** Mode=ReadOnly)
- virtual void **Close** ()

- int **GetAttribute** (const std::string &varName, const std::string &attName, double &attValue, bool must-Exist=true, double defaultValue=**CTools::m\_defaultValueDOUBLE**)
- int **GetAttribute** (const std::string &varName, const std::string &attName, std::string &attValue, bool must-Exist=true, std::string defaultValue="")
- virtual void **GetAxisVars** (std::vector< std::string > &VarNames)
- std::string **GetComment** (const std::string &varName)
- virtual bool **GetCommonVarDims** (const std::string &varName1, const std::string &varName2, CStringArray &intersect)
- virtual bool **GetComplementVarDims** (const std::string &varName1, const std::string &varName2, CStringArray &complement)
- virtual bool **GetComplementVars** (const CStringArray &varNames, CStringArray &complement, bool excludeDim=true)
- virtual void **GetDataVars** (std::vector< std::string > &VarNames)
- int **GetDimId** (const std::string &name)
- CNetCDFFiles \* **GetFile** ()
- uint32\_t **GetMaxFieldNumberOfDims** (const CStringArray \*fieldNames=NULL)
- virtual std::string **GetName** () const
- CNetCDFDimension \* **GetNetCDFDim** (const std::string &name)
- **COBMap** \* **GetNetCDFDims** ()
- void **GetNetCDFDims** (const std::string &varName, **COBArray** \*dims)
- CNetCDFVarDef \* **GetNetCDFVarDef** (const std::string &name)
- **COBMap** \* **GetNetCDFVarDefs** ()
- virtual std::string **GetTitle** (const std::string &Name)
- virtual std::string **GetType** ()
- virtual CUnit **GetUnit** (const std::string &Name)
- int32\_t **GetVarDimIndex** (const std::string &varName, const std::string &dimName)
- virtual void **GetVarDims** (const std::string &Name, ExpressionValueDimensions &Dimensions)
- virtual void **GetVarDims** (const std::string &Name, std::vector< std::string > &Dimensions)
- virtual void **GetVariables** (std::vector< std::string > &VarNames)
- virtual NetCDFVarKind **GetVarKind** (const std::string &Name)
- virtual bool **HasVar** (NetCDFVarKind VarKind)
- bool **IsAxisVar** (const std::string &Name)
- virtual bool **IsGeographic** ()
- virtual bool **IsOpened** ()
- virtual void **Open** (brathl\_FileMode mode)
- virtual void **Open** ()
- virtual void **ReadVar** (const std::string &Name, **CExpressionValue** &Value, const std::string &WantedUnit)
- void **ReplaceNetCDFDim** (CNetCDFDimension &dim)
- virtual void **SetMode** (brathl\_FileMode mode)
- virtual void **SetName** (const std::string &name)
- virtual bool **VarExists** (const std::string &Name)
- virtual void **WriteData** (CNetCDFVarDef \*varDef, **CExpressionValue** \*data)
- virtual void **WriteData** (CNetCDFVarDef \*varDef, CMatrix \*matrix)
- virtual void **WriteDimensions** ()
- virtual void **WriteFileTitle** (const std::string &Title)
- virtual void **WriteVar** (const std::string &Name, const **CExpressionValue** &Value)
- virtual void **WriteVariables** ()



## Static Public Member Functions

- static **CInternalFiles** \* **Create** (const std::string &fileName, bool open=true, bool withExcept=true)
- static bool **IsVarNameValid** (const std::string &Name)
- static bool **IsYFXFile** (const std::string &fileName, **CInternalFiles** \*\*pf=NULL)
- static bool **IsYFXFile** (**CInternalFiles** \*f, CStringArray \*fieldNamesIn=NULL)
- static bool **IsZFlatLonFile** (const std::string &fileName, **CInternalFiles** \*\*pf=NULL)
- static bool **IsZFlatLonFile** (**CInternalFiles** \*f)
- static bool **IsZFXFile** (const std::string &fileName, CStringArray \*fieldNames=NULL, **CInternalFiles** \*\*pf=NULL)
- static bool **IsZFXFile** (**CInternalFiles** \*f, CStringArray \*fieldNames=NULL)
- static std::string **TypeOf** ()

## Protected Member Functions

- void **SetFixedGlobalAttributes** (void)

## Protected Attributes

- CNetCDFFiles **m\_file**

## 8.58.1 Detailed Description

Internal files access.

## Version

1.0

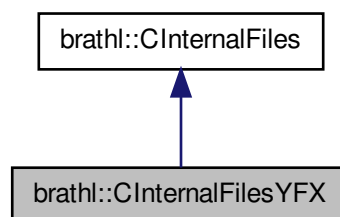
The documentation for this class was generated from the following files:

- InternalFiles.h
- InternalFiles.cpp

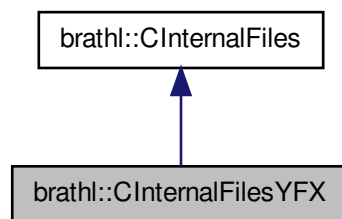
## 8.59 bratl::CInternalFilesYFX Class Reference

```
#include <InternalFilesYFX.h>
```

Inheritance diagram for bratl::CInternalFilesYFX:



Collaboration diagram for brathl::CInternalFilesYFX:



#### Public Member Functions

- **CInternalFilesYFX** (std::string Name="", **brathl\_FileMode** Mode=ReadOnly)
- virtual void **CreateData** (const std::string &Name, const std::string &Units, const std::string &LongName, const std::string &Comment="", double ValidMin=**CTools::m\_defaultValueDOUBLE**, double ValidMax=**CTools::m\_defaultValueDOUBLE**, nc\_type Type=NC\_DOUBLE)
- virtual void **CreateDim** (NetCDFVarKind Kind, const std::string &XName, const **CExpressionValue** &Values, const std::string &Units, const std::string &LongName, const std::string &Comment="", double ValidMin=**CTools::m\_defaultValueDOUBLE**, double ValidMax=**CTools::m\_defaultValueDOUBLE**)
- virtual std::string **GetType** ()

#### Static Public Member Functions

- static std::string **TypeOf** ()

#### Additional Inherited Members

##### 8.59.1 Detailed Description

Internal files access for internal files used to store  $Y=F(X)$  kind of data.

#### Version

1.0

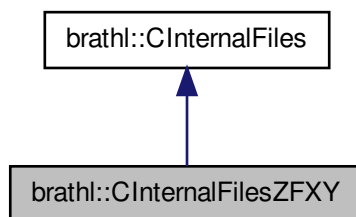
The documentation for this class was generated from the following files:

- InternalFilesYFX.h
- InternalFilesYFX.cpp

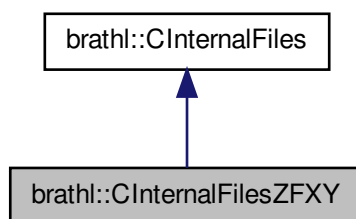
## 8.60 brathl::CInternalFilesZFX Class Reference

```
#include <InternalFilesZFX.h>
```

Inheritance diagram for bratl::CInternalFilesZFX Y:



Collaboration diagram for bratl::CInternalFilesZFX Y:



#### Public Member Functions

- **CInternalFilesZFX Y** (std::string Name="", **bratl\_ FileMode** Mode=ReadOnly)
- virtual void **CreateData** (const std::string &Name, const std::string &Units, const std::string &LongName, const std::string &Dim1Name, const std::string &Dim2Name, const std::string &Comment="", double ValidMin=**CTools::m\_defaultValueDOUBLE**, double ValidMax=**CTools::m\_defaultValueDOUBLE**, nc\_type Type=NC\_DOUBLE)
- virtual void **CreateDim** (NetCDFVarKind Kind, const std::string &XName, const **CExpressionValue** &Values, const std::string &Units, const std::string &LongName, const std::string &Comment="", double ValidMin=**CTools::m\_defaultValueDOUBLE**, double ValidMax=**CTools::m\_defaultValueDOUBLE**)
- virtual std::string **GetType** ()
- virtual bool **IsGeographic** ()

#### Static Public Member Functions

- static std::string **TypeOf** ()

#### Additional Inherited Members

## 8.60.1 Detailed Description

Internal files access for internal files used to store  $Y=F(X)$  kind of data.

## Version

1.0

The documentation for this class was generated from the following files:

- InternalFilesZFX.Y.h
- InternalFilesZFX.Y.cpp

## 8.61 brathl::CIntList Class Reference

```
#include <List.h>
```

## Public Member Functions

- **CIntList** ()  
*Empty **CIntList** (p. 250) ctor.*
- **CIntList** (const **CIntList** &list)
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual void **Insert** (const **CIntList** &list, bool bEnd=true)
- virtual void **Insert** (const int value, bool bEnd=true)
- const **CIntList** & **operator=** (const **CIntList** &lst)
- virtual void **RemoveAll** ()
- virtual ~**CIntList** ()  
*Destructor.*

## 8.61.1 Detailed Description

A std::list of strings management class.

## Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.62 brathl::CIntMap Class Reference

```
#include <List.h>
```

## Public Member Functions

- **CIntMap** ()  
*CIntMap* (p. 250) *ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump function.*
- virtual bool **Erase** (CIntMap::iterator it)
- virtual bool **Erase** (const std::string &key)
- virtual int32\_t **Exists** (const std::string &key) const
- virtual int32\_t **Insert** (const std::string &key, int32\_t value, bool withExcept=true)
- virtual void **Insert** (const **CIntMap** &m, bool bRemoveAll=true, bool withExcept=true)
- virtual void **Insert** (const CStringArray &keys, const CIntArray &values, bool bRemoveAll=true, bool withExcept=true)
- virtual int32\_t **operator[]** (const std::string &key)
- virtual void **RemoveAll** ()
- virtual ~**CIntMap** ()  
*CIntMap* (p. 250) *dtor.*

## 8.62.1 Detailed Description

a set of integer value management classes.

## Version

1.0

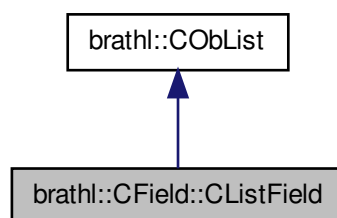
The documentation for this class was generated from the following files:

- List.h
- List.cpp

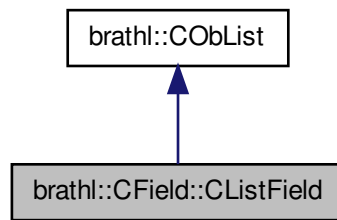
## 8.63 brathl::CField::CListField Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CField::CListField:



Collaboration diagram for brathl::CField::CListField:



#### Public Member Functions

- **CField \* Back** (bool withExcept=true)
- **CListField** (bool bDelete)
- **CField \* Front** (bool withExcept=true)
- virtual void **InsertField** (**CField** \*field, bool hasDataset=true, bool bEnd=true)
- void **RemoveAll** ()

#### Public Attributes

- CUIntArray **m\_fieldSetDim**
- int32\_t **m\_nbFieldSetDims**

#### Additional Inherited Members

##### 8.63.1 Detailed Description

A list of **CField** (p. 205) object management class

#### Version

1.0

##### 8.63.2 Member Function Documentation

###### 8.63.2.1 void brathl::CField::CListField::RemoveAll ( ) [virtual]

Remove all elements and clear the std::list

Reimplemented from **brathl::CObList** (p. 42).

References `brathl::CObList::RemoveAll()`.

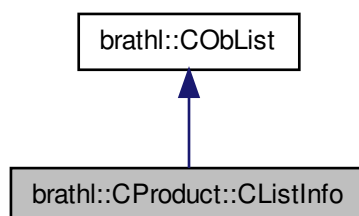
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

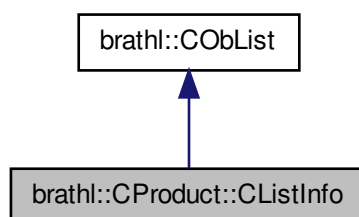
## 8.64 bratl::CProduct::CListInfo Class Reference

```
#include <Product.h>
```

Inheritance diagram for bratl::CProduct::CListInfo:



Collaboration diagram for bratl::CProduct::CListInfo:



### Public Member Functions

- **CInfo \* AddNew** ()
- **CInfo \* Back** (bool withExcept=true)
- **CInfo \* Front** (bool withExcept=true)
- **CInfo \* PrevBack** (bool withExcept=true)

### Additional Inherited Members

#### 8.64.1 Detailed Description

A list of **CInfo** (p. 245) object management class

### Version

1.0

The documentation for this class was generated from the following files:

- Product.h
- Product.cpp

## 8.65 brathl::CMapParameter Class Reference

```
#include <MapParameter.h>
```

### Public Member Functions

- **CMapParameter** ()  
*CMapParameter* (p. 254) *ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- bool **Erase** (CMapParameter::iterator iteratorParameter)
- bool **Erase** (const std::string &key)
- **CParameter \* Exists** (const std::string &key)
- **CParameter \* Insert** (const std::string &key, const std::string &value)
- **CParameter \* operator[]** (const std::string key)
- void **RemoveAll** ()
- virtual **~CMapParameter** ()  
*CMapParameter* (p. 254) *dtor.*

### 8.65.1 Detailed Description

Parameter management class.

This class provides a std::map of **CParameter** (p. 265) objects

#### Version

1.0

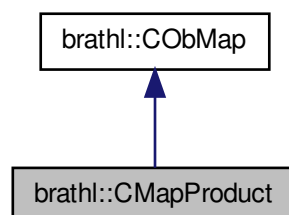
The documentation for this class was generated from the following files:

- **MapParameter.h**
- MapParameter.cpp

## 8.66 brathl::CMapProduct Class Reference

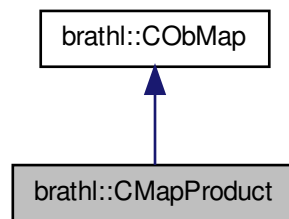
```
#include <Product.h>
```

Inheritance diagram for brathl::CMapProduct:





Collaboration diagram for brathl::CMapProduct:



#### Public Member Functions

- void **AddCriteriaToProducts** ()
- **CMapProduct** ()  
*ClntMap* (p. 250) ctor.
- virtual void **Dump** (std::ostream &fOut=std::cerr)
- void **GetProductKeysWithCriteria** (CStringArray &keys)
- void **RemoveCriteriaFromProducts** ()
- virtual **~CMapProduct** ()  
*ClntMap* (p. 250) dtor.

#### Static Public Member Functions

- static **CMapProduct &GetInstance** ()

#### Protected Member Functions

- void **Init** ()

#### Additional Inherited Members

##### 8.66.1 Detailed Description

Mapping products management class.

#### Version

1.0

The documentation for this class was generated from the following files:

- Product.h
- Product.cpp

## 8.67 brathl::CMission Class Reference

```
#include <Mission.h>
```

## Public Member Functions

- **CMission** (**brathl\_mission** mission, bool printWarnings=true)
- **CMission** (const std::string &product\_type, bool printWarnings=true)
- **CMission** (**brathl\_mission** mission, const double repeat, const **CDate** &dateRef, const uint32\_t cycleRef, const uint32\_t passRef, const uint32\_t nbPass, bool printWarnings=true)
- int32\_t **Convert** (**CDate** &date, uint32\_t &cycle, uint32\_t &pass)
- int32\_t **Convert** (uint32\_t cycle, uint32\_t pass, **CDate** &date)
- int32\_t **CtrlMission** ()
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- uint32\_t **GetCycleRef** ()
- const **CDate** & **GetDateRef** ()
- **brathl\_mission** **GetMission** ()
- const char \*const **GetName** ()
- uint32\_t **GetNbPass** ()
- uint32\_t **GetPassRef** ()
- double **GetRepeat** ()
- int32\_t **LoadAliasName** (CStringList &aliases)
- const **CMission** & **operator=** (const **CMission** &m)

## Static Public Member Functions

- static double **GetGlobalConstant** (brathl\_global\_constants constantValue)

## Static Public Attributes

- static const int **m\_maxLenName** = 30
- static const char \* **m\_nameE2** = "ERS2"
- static const char \* **m\_nameE\_C** = "ERS1-A"
- static const char \* **m\_nameE\_G** = "ERS1-B"
- static const char \* **m\_nameEN** = "ENVISAT"
- static const char \* **m\_nameG2** = "GFO"
- static const char \* **m\_nameJ1** = "Jason-1"
- static const char \* **m\_nameJ2** = "Jason-2"
- static const char \* **m\_nameTP** = "TopeX/Poseidon"
- static const char \* **m\_nameUnknown** = "Unknown mission"

## Static Protected Attributes

- static const char \* **m\_refAliasName** = "brathl\_aliasmission.txt"
- static const char \* **m\_refFileName** = "brathl\_refmission.txt"

## 8.67.1 Detailed Description

Satellite cycle/date conversion class.

A class to convert a date in a satellite cycle and pass number, or vice versa

## Version

1.0

## 8.67.2 Constructor &amp; Destructor Documentation

## 8.67.2.1 brathl::CMission::CMission ( brathl\_mission mission, bool printWarnings = true )

Constructs a **CMission** (p. 255) object

## Parameters

<i>mission</i>	[in] : mission type (see <b>brathl_mission</b> (p. 338))
<i>printWarnings</i>	[in] : set to true for printing warnings on standard output, false otherwise. Default value is true.

References m\_nameUnknown.

## 8.67.2.2 brathl::CMission::CMission ( const std::string &amp; product\_type, bool printWarnings = true )

Constructs a **CMission** (p. 255) object

## Parameters

<i>product_type</i>	[in] : mission name or product type/label
<i>printWarnings</i>	[in] : set to true for printing warnings on standard output, false otherwise. Default value is true.

## 8.67.2.3 brathl::CMission::CMission ( brathl\_mission mission, const double repeat, const CDate &amp; dateRef, const uint32\_t cycleRef, const uint32\_t passRef, const uint32\_t nbPass, bool printWarnings = true )

Constructs a **CMission** (p. 255) object

## Parameters

<i>mission</i>	[in] : mission type (see <b>brathl_mission</b> (p. 338))
<i>repeat</i>	[in] : duration that takes the satellite to return at the same point
<i>dateRef</i>	[in] : date reference in decimal julian day
<i>cycleRef</i>	[in] : cycle reference
<i>passRef</i>	[in] : pass reference
<i>nbPass</i>	[in] : numbers of half passes in a cycle
<i>printWarnings</i>	[in] : set to true for printing warnings on standard output, false otherwise. Default value is true.

References m\_nameUnknown.

## 8.67.3 Member Function Documentation

## 8.67.3.1 int32\_t brathl::CMission::Convert ( CDate &amp; date, uint32\_t &amp; cycle, uint32\_t &amp; pass )

Converts a **CDate** (p. 175) object into a cycle/pass

## Parameters

<i>date</i>	[in] : date to convert
<i>cycle</i>	[out] : number of cycle
<i>pass</i>	[out] : number of pass in the cycle

## Returns

#BRATHL\_SUCCESS or error code (see Cycle\_date\_error\_codes)

References brathl::CDate::Convert2DecimalJulian().

Referenced by brathl\_Cycle2YMDHMSM(), and brathl\_YMDHMSM2Cycle().

### 8.67.3.2 int32\_t brathl::CMission::Convert ( uint32\_t cycle, uint32\_t pass, CDate & date )

Converts a cycle/pass into a **CDate** (p. 175) object

#### Parameters

<i>cycle</i>	[in] : number of cycle to convert
<i>pass</i>	[in] : number of pass in the cycle to convert
<i>date</i>	[out] : date corresponding to the cycle/pass

#### Returns

#BRATHL\_SUCCESS or error code (see Cycle\_date\_error\_codes)

References brathl::CDate::SetDateJulian().

### 8.67.3.3 int32\_t brathl::CMission::CtrlMission ( ) [inline]

Checks if the mission is valid (no errors occurred during construction)

#### Returns

#BRATHL\_SUCCESS or error code (see Cycle\_date\_error\_codes)

Referenced by brathl\_Cycle2YMDHMSM(), and brathl\_YMDHMSM2Cycle().

### 8.67.3.4 uint32\_t brathl::CMission::GetCycleRef ( ) [inline]

Gets the cycle reference attributes (see #m\_cycleRef)

### 8.67.3.5 const CDate& brathl::CMission::GetDateRef ( ) [inline]

Gets the date reference attributes (see #m\_dateRef)

### 8.67.3.6 brathl\_mission brathl::CMission::GetMission ( ) [inline]

Gets the mission (see **brathl\_mission** (p. 338))

### 8.67.3.7 const char\* const brathl::CMission::GetName ( ) [inline]

Gets the name of the mission

### 8.67.3.8 uint32\_t brathl::CMission::GetNbPass ( ) [inline]

Gets the number of passes attributes (see #m\_nbPass)

### 8.67.3.9 uint32\_t brathl::CMission::GetPassRef ( ) [inline]

Gets the pass reference attributes (see #m\_passRef)

### 8.67.3.10 double brathl::CMission::GetRepeat ( ) [inline]

Gets the repeat attributes (see #m\_repeat)

### 8.67.3.11 int32\_t brathl::CMission::LoadAliasName ( CStringList & aliases )

Gets aliases names for the mission

#### Parameters

<i>aliases</i>	[out] : aliases for the mission
----------------	---------------------------------

## Returns

#BRATHL\_SUCCESS or error code (see Cycle\_date\_error\_codes)

References brathl::CFile::Close(), brathl::CTools::FindDataFile(), brathl::CTools::GetInternalDataDir(), brathl::CFile::IsOpen(), m\_refAliasName, brathl::CFile::modeRead, brathl::CFile::ReadLineData(), and brathl::CTools::StringTrim().

### 8.67.3.12 const CMission & brathl::CMission::operator= ( const CMission & m )

Assigns a new value to the **CMission** (p. 255) object, with a **CMission** (p. 255) object

## 8.67.4 Member Data Documentation

### 8.67.4.1 const int brathl::CMission::m\_maxLenName = 30 [static]

Max length of the name of the mission

### 8.67.4.2 const char \* brathl::CMission::m\_nameE2 = "ERS2" [static]

Name of the ERS2 mission

### 8.67.4.3 const char \* brathl::CMission::m\_nameE\_C = "ERS1-A" [static]

Name of the ERS1-A mission

### 8.67.4.4 const char \* brathl::CMission::m\_nameE\_G = "ERS1-B" [static]

Name of the ERS1-B mission

### 8.67.4.5 const char \* brathl::CMission::m\_nameEN = "ENVISAT" [static]

Name of the ENVISAT mission

### 8.67.4.6 const char \* brathl::CMission::m\_nameG2 = "GFO" [static]

Name of the GFO mission

### 8.67.4.7 const char \* brathl::CMission::m\_nameJ1 = "Jason-1" [static]

Name of the Jason-1 mission

### 8.67.4.8 const char \* brathl::CMission::m\_nameJ2 = "Jason-2" [static]

Name of the Jason-2 mission

### 8.67.4.9 const char \* brathl::CMission::m\_nameTP = "Topex/Poseidon" [static]

Name of the Topex/Poseidon mission

### 8.67.4.10 const char \* brathl::CMission::m\_nameUnknown = "Unknown mission" [static]

Name of an unknown mission

Referenced by CMission().

### 8.67.4.11 const char \* brathl::CMission::m\_refAliasName = "brathl\_aliasmission.txt" [static], [protected]

Name of the mission aliases file

An ascii file with records : field 1 : Name of the mission field 2 : Alias of the mission

Each field has to be separated by at least a non-numeric character

The file can contained several record for a same mission.

Referenced by LoadAliasName().

**8.67.4.12** `const char * bratl::CMission::m_refFileName = "bratl_refmission.txt"` [static],[protected]

Name of the mission reference file

An ascii file with records : field 1 : Mission ID field 3 : Name of the mission field 3 : cycle reference field 4 : pass reference field 5 : date reference in decimal julian day field 6 : repeat period in decimal number of days field 7 : number of passes in one repeat cycle

Each field has to be separated by at least a non-numeric character

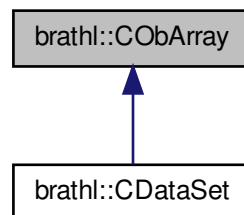
The documentation for this class was generated from the following files:

- Mission.h
- Mission.cpp

## 8.68 bratl::CObArray Class Reference

```
#include <List.h>
```

Inheritance diagram for bratl::CObArray:



### Public Member Functions

- **CObArray** (bool bDelete=true)  
*Empty CObArray (p. 260) ctor.*
- **CObArray** (const **CObArray** &vect)
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- bool **Erase** (CBratObject \*ob)
- virtual bool **Erase** (CObArray::iterator it)
- virtual bool **Erase** (int32\_t index)
- bool **GetDelete** ()
- virtual void **Insert** (const **CObArray** &vect)
- virtual void **Insert** (CBratObject \*ob)
- virtual CObArray::iterator **InsertAt** (CObArray::iterator where, CBratObject \*ob)
- virtual const **CObArray** & **operator=** (const **CObArray** &lst)
- virtual bool **PopBack** ()
- virtual void **RemoveAll** ()

- virtual CObArray::iterator **ReplaceAt** (CObArray::iterator where, CBratObject \*ob)
- void **SetDelete** (bool value)
- virtual **~CObArray** ()

*Destructor.*

#### Protected Attributes

- bool **m\_bDelete**

#### 8.68.1 Detailed Description

An array (std::vector) of CBratObject management class.

#### Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.69 brathl::CObDoubleMap Class Reference

```
#include <List.h>
```

#### Public Member Functions

- **CObDoubleMap** (bool bDelete=true)  
*CObMap* (p. 264) *ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual bool **Erase** (CObDoubleMap::iterator it)
- virtual bool **Erase** (double key)
- virtual CBratObject \* **Exists** (double key) const
- bool **GetDelete** ()
- virtual void **GetKeys** (CDoubleArray &keys, bool bRemoveAll=true)
- virtual CBratObject \* **Insert** (double key, CBratObject \*ob, bool withExcept=true)
- virtual void **Insert** (const **CObDoubleMap** &obMap, bool withExcept=true)
- virtual const **CObDoubleMap** & **operator=** (const **CObDoubleMap** &obMap)
- virtual CBratObject \* **operator[]** (double key)
- virtual void **RemoveAll** ()
- bool **RenameKey** (double oldKey, double newKey)
- void **SetDelete** (bool value)
- virtual **~CObDoubleMap** ()  
*CObMap* (p. 264) *dtor.*

#### Protected Attributes

- bool **m\_bDelete**

## 8.69.1 Detailed Description

a set of object management classes.

## Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.70 brathl::COblntMap Class Reference

```
#include <List.h>
```

## Public Member Functions

- **COblntMap** (bool bDelete=true)  
*COBMap* (p. 264) ctor.
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual bool **Erase** (COblntMap::iterator it)
- virtual bool **Erase** (int32\_t key)
- virtual CBratObject \* **Exists** (int32\_t key) const
- bool **GetDelete** ()
- virtual void **GetKeys** (CIntArray &keys, bool bRemoveAll=true)
- virtual CBratObject \* **Insert** (int32\_t key, CBratObject \*ob, bool withExcept=true)
- virtual void **Insert** (const **COblntMap** &obMap, bool withExcept=true)
- virtual const **COblntMap** & **operator=** (const **COblntMap** &obMap)
- virtual CBratObject \* **operator[]** (int32\_t key)
- virtual void **RemoveAll** ()
- bool **RenameKey** (int32\_t oldKey, int32\_t newKey)
- void **SetDelete** (bool value)
- virtual ~**COblntMap** ()  
*COBMap* (p. 264) dtor.

## Protected Attributes

- bool **m\_bDelete**

## 8.70.1 Detailed Description

a set of object management classes.

## Version

1.0

The documentation for this class was generated from the following files:

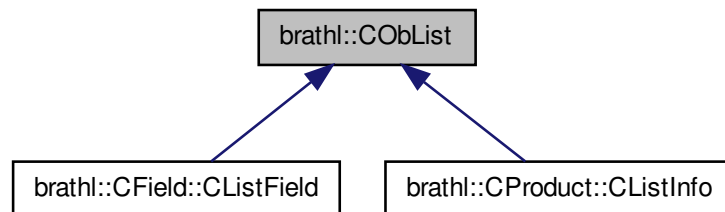
- List.h
- List.cpp



## 8.71 brathl::CObList Class Reference

```
#include <List.h>
```

Inheritance diagram for brathl::CObList:



## Public Member Functions

- **CObList** (bool bDelete=true)  
*Empty CObList (p. 263) ctor.*
- **CObList** (const **CObList** &lst)
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump function.*
- bool **Erase** (CBratObject \*ob)
- virtual bool **Erase** (CObList::iterator it)
- bool **GetDelete** ()
- virtual void **Insert** (const **CObList** &list, bool bEnd=true)
- virtual void **Insert** (CBratObject \*ob, bool bEnd=true)
- virtual const **CObList** & **operator=** (const **CObList** &lst)
- virtual bool **PopBack** ()
- virtual void **RemoveAll** ()
- void **SetDelete** (bool value)
- virtual ~**CObList** ()  
*Destructor.*

## Protected Attributes

- bool **m\_bDelete**

## 8.71.1 Detailed Description

A std::list of CBratObject management class.

## Version

1.0

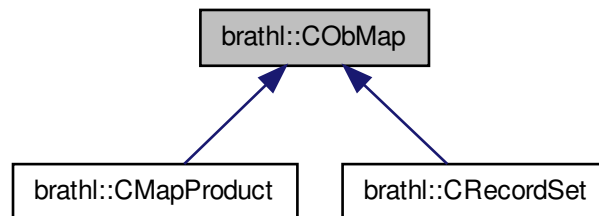
The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.72 brathl::CObMap Class Reference

```
#include <List.h>
```

Inheritance diagram for brathl::CObMap:



## Public Member Functions

- **CObMap** (bool bDelete=true)  
*CObMap* (p. 264) ctor.
- **CObMap** (const **CObMap** &obMap)
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump function.*
- virtual bool **Erase** (CObMap::iterator it)
- virtual bool **Erase** (const std::string &key)
- virtual CBratObject \* **Exists** (const std::string &key) const
- bool **GetDelete** ()
- virtual void **GetKeys** (CStringArray &keys, bool bRemoveAll=true, bool bUnique=false)
- virtual void **GetKeys** (CStringList &keys, bool bRemoveAll=true, bool bUnique=false)
- virtual CBratObject \* **Insert** (const std::string &key, CBratObject \*ob, bool withExcept=true)
- virtual void **Insert** (const **CObMap** &obMap, bool withExcept=true)
- virtual const **CObMap** & **operator=** (const **CObMap** &obMap)
- virtual CBratObject \* **operator[]** (const std::string &key)
- virtual void **RemoveAll** ()
- bool **RenameKey** (const std::string &oldKey, const std::string &newKey)
- void **SetDelete** (bool value)
- virtual void **ToArray** (CObArray &obArray)
- virtual ~**CObMap** ()  
*CObMap* (p. 264) dtor.

## Protected Attributes

- bool **m\_bDelete**

## 8.72.1 Detailed Description

a set of object management classes.

## Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.73 brathl::CObStack Class Reference

```
#include <List.h>
```

## Public Member Functions

- **CObStack** (bool bDelete=true)  
*Empty CObArray (p. 260) ctor.*
- bool **GetDelete** ()
- virtual void **Pop** ()
- virtual void **Push** (CBratObject \*ob)
- virtual void **RemoveAll** ()
- void **SetDelete** (bool value)
- virtual CBratObject \* **Top** ()
- virtual ~**CObStack** ()  
*Destructor.*

## Protected Attributes

- bool **m\_bDelete**  
*Dump fonction.*

### 8.73.1 Detailed Description

An std::stack of CBratObject management class.

## Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.74 brathl::CParameter Class Reference

```
#include <Parameter.h>
```

## Public Member Functions

- **size\_t Count** ()
- **CParameter** ()
  - Empty CParameter (p. 265) ctor.*
- **CParameter** (const char \*keyword)
- virtual void **Dump** (std::ostream &fOut=std::cerr)
  - Dump fonction.*
- void **GetValue** (char \*value, size\_t bufferSize, int32\_t pos=0, const char \*DefValue="")
- bool **RemoveAllValue** ()
- bool **RemoveValue** (uint32\_t i)
- void **SetAliases** (const CStringMap &aliases)
- virtual ~**CParameter** ()
  - Destructor.*
- **CParameter** (const char \*keyword, const char \*value)
- **CParameter** (const std::string &keyword, const std::string &value)
- void **AddValue** (const char \*value)
- void **AddValue** (const std::string &value)
- void **GetValue** (int32\_t &value, int32\_t pos=0, int32\_t DefValue=CTools::m\_defaultValueINT32)
- void **GetValue** (uint32\_t &value, int32\_t pos=0, uint32\_t DefValue=CTools::m\_defaultValueUINT32)
- void **GetValue** (double &value, int32\_t pos=0, double DefValue=CTools::m\_defaultValueDOUBLE)
- void **GetValue** (bool &value, int32\_t pos=0, bool DefValue=false)
- void **GetValue** (CDate &value, int32\_t pos=0)
- void **GetValue** (CDate &value, CUnit &unit, int32\_t pos=0)
- void **GetValue** (CDate &value, const std::string &strUnit, int32\_t pos=0)
- void **GetValue** (CDate &value, CUnit \*unit, int32\_t pos=0)
- void **GetValue** (std::string &value, int32\_t pos=0, const std::string &DefValue="")
- void **GetValue** (CExpression &value, int32\_t pos=0)
- void **GetValue** (CUnit &value, int32\_t pos=0, const std::string &DefValue="count")
- void **GetValue** (uint32\_t &value, std::string &ValueName, const KWValueListEntry \*KeywordList, int32\_t pos=0, uint32\_t DefValue=CTools::m\_defaultValueUINT32)
- void **GetValue** (bitSet32 &value, const KWValueListEntry \*KeywordList, int32\_t pos=0, const bitSet32 &DefValue=0)
- void **GetValue** (uint32\_t &value, std::string &ValueName, CUIntMap &KeywordList, int32\_t pos, uint32\_t DefValue)
- void **GetAllValues** (CExpression &value, const std::string &Combine="&&")
- void **GetAllValues** (CStringList &listValues)
- void **GetAllValues** (CStringArray &listValues)

## 8.74.1 Detailed Description

Parameter management class.

One parameter can have 1 to n value.

This class stands for parameters

## Version

1.0

## 8.74.2 Constructor &amp; Destructor Documentation

8.74.2.1 brathl::CParameter::CParameter ( const char \* *keyword* )

Creates a new **CParameter** (p. 265) object.

## Parameters

<i>keyword</i>	[in] : parameter name
----------------	-----------------------

8.74.2.2 brathl::CParameter::CParameter ( const char \* *keyword*, const char \* *value* )

Creates a new **CParameter** (p. 265) object.

## Parameters

<i>keyword</i>	[in] : parameter name
<i>value</i>	[in] : parameter value

## 8.74.3 Member Function Documentation

8.74.3.1 void brathl::CParameter::AddValue ( const char \* *value* )

Adds a value to the **CParameter** (p. 265) object.

## Parameters

<i>value</i>	[in] : parameter value
--------------	------------------------

References brathl::CTools::ExpandShellVar().

Referenced by brathl::CMapParameter::Insert().

## 8.74.3.2 size\_t brathl::CParameter::Count ( )

## Returns

the number of values.

Referenced by brathl::CFileParams::CheckCount().

8.74.3.3 void brathl::CParameter::GetValue ( int32\_t & *value*, int32\_t *pos* = 0, int32\_t *DefValue* = CTools::m\_defaultValueINT32 )

gets a **CParameter** (p. 265) object value at a given position If the list of values is empty or index pos is out of range a CParameterException is raised.

## Parameters

<i>value</i>	[out] : parameter value
<i>pos</i>	[in] : position of the parameter 0.. n (default is 0, first value)

References brathl::CTools::Format(), and brathl::CTools::StrCaseCmp().

8.74.3.4 void brathl::CParameter::GetValue ( char \* *value*, size\_t *bufferSize*, int32\_t *pos* = 0, const char \* *DefValue* = " " )

gets a **CParameter** (p. 265) object value at a given position If the list of values is empty or index pos is out of range a CParameterException is raised. WARNING : if size of std::string value is smaller than the size of the parameter value, data will be truncated

## Parameters

<i>value</i>	[out] : parameter value
<i>bufferSize</i>	[in] : size of value
<i>pos</i>	[in] : position of the parameter 0.. n (default is 0, first value)

## Returns

false if one can't get the value, otherwise true

References brathl::CTools::StrCaseCmp().

## 8.74.3.5 bool brathl::CParameter::RemoveAllValue ( )

Removes all values.

## 8.74.3.6 bool brathl::CParameter::RemoveValue ( uint32\_t i )

Removes a value at a given position. The first value is at the index 0.

## Parameters

<i>i</i>	[in] : index value to remove
----------	------------------------------

## 8.74.3.7 void brathl::CParameter::SetAliases ( const CStringMap &amp; aliases )

Register the formulas aliases defined.

## Parameters

<i>Aliases</i>	[in] : Names/values of aliases
----------------	--------------------------------

References brathl::CTools::ExpandVariables().

The documentation for this class was generated from the following files:

- Parameter.h
- Parameter.cpp

## 8.75 brathl::CProductAop Class Reference

```
#include <ProductAop.h>
```

Inherits brathl::CProduct.

## Public Member Functions

- **CProductAop** ()  
*Empty CProductAop (p. 268) ctor.*
- **CProductAop** (const std::string &fileName)
- **CProductAop** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()
- virtual ~**CProductAop** ()  
*Destructor.*

## Protected Member Functions

- virtual void **InitDateRef** ()

## Additional Inherited Members

## 8.75.1 Detailed Description

Aop product management class.

## Version

1.0

## 8.75.2 Constructor &amp; Destructor Documentation

8.75.2.1 brathl::CProductAop::CProductAop ( const std::string & *fileName* )

Creates new **CProductAop** (p. 268) object

## Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

8.75.2.2 brathl::CProductAop::CProductAop ( const CStringList & *fileNameList* )

Creates new **CProductAop** (p. 268) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

The documentation for this class was generated from the following files:

- ProductAop.h
- ProductAop.cpp

## 8.76 brathl::CProductCryosat Class Reference

```
#include <ProductCryosat.h>
```

Inherits brathl::CProduct.

## Public Member Functions

- **CProductCryosat** ()  
*Empty CProductCryosat (p. 269) ctor.*
- **CProductCryosat** (const std::string &fileName)
- **CProductCryosat** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()
- virtual **~CProductCryosat** ()  
*Destructor.*

## Protected Member Functions

- virtual bool **FindParentToRead** (CField \*fromField, CObList \*parentFieldList)
- virtual void **InitDateRef** ()
- virtual bool **IsHighResolutionField** (CField \*field)
- virtual void **ProcessHighResolutionWithoutFieldCalculation** ()

## Additional Inherited Members

## 8.76.1 Detailed Description

Cryosat product management class.

## Version

1.0

## 8.76.2 Constructor &amp; Destructor Documentation

## 8.76.2.1 brathl::CProductCryosat::CProductCryosat ( const std::string &amp; fileName )

Creates new **CProductCryosat** (p. 269) object

## Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

## 8.76.2.2 brathl::CProductCryosat::CProductCryosat ( const CStringList &amp; fileNameList )

Creates new **CProductCryosat** (p. 269) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

The documentation for this class was generated from the following files:

- ProductCryosat.h
- ProductCryosat.cpp

## 8.77 brathl::CProductEnvisat Class Reference

```
#include <ProductEnvisat.h>
```

Inherits brathl::CProduct.

## Public Member Functions

- **CProductEnvisat** ()  
*Empty CProductEnvisat (p. 270) ctor.*
- **CProductEnvisat** (const std::string &fileName)
- **CProductEnvisat** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()



- virtual **~CProductEnvisat** ()

*Destructor.*

#### Protected Member Functions

- virtual void **AddInternalHighResolutionFieldCalculation** ()
- void **ComputeHighResolutionFields** (CDataSet \*dataSet)
- void **ComputeHighResolutionFields** (CDataSet \*dataSet, double deltaLat, double deltaLon)
- virtual bool **FindParentToRead** (CField \*fromField, CObList \*parentFieldList)
- virtual std::string **GetHighResolutionLatDiffFieldName** ()
- virtual std::string **GetHighResolutionLonDiffFieldName** ()
- virtual bool **HasHighResolutionFieldCalculation** ()
- bool **HasHighResolutionFieldCalculationValue** (CDataSet \*dataset)
- bool **HasHighResolutionFieldCalculationValue** (CDataSet \*dataset, CFieldSetArrayDbf \*fieldSetArrayDbf)
- virtual void **InitDateRef** ()
- virtual bool **IsHighResolutionField** (CField \*field)
- bool **IsParentHighResolutionField** (CField \*field)
- virtual void **ProcessHighResolutionWithFieldCalculation** ()
- virtual void **ProcessHighResolutionWithoutFieldCalculation** ()
- virtual void **SetHighResolutionLatDiffFieldName** (const std::string &value)
- virtual void **SetHighResolutionLonDiffFieldName** (const std::string &value)

#### Protected Attributes

- CStringArray **m\_arrayTimeStampFieldName**
- std::string **m\_highResolutionLatDiffFieldName**
- std::string **m\_highResolutionLonDiffFieldName**
- std::string **m\_timeStampFieldName**

#### Additional Inherited Members

##### 8.77.1 Detailed Description

Envisat product management class.

##### Version

1.0

##### 8.77.2 Constructor & Destructor Documentation

###### 8.77.2.1 brathl::CProductEnvisat::CProductEnvisat ( const std::string & fileName )

Creates new **CProductEnvisat** (p. 270) object

##### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

###### 8.77.2.2 brathl::CProductEnvisat::CProductEnvisat ( const CStringList & fileNameList )

Creates new **CProductEnvisat** (p. 270) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.77.3 Member Function Documentation

**8.77.3.1** `virtual std::string brathl::CProductEnvisat::GetHighResolutionLatDiffFieldName ( ) [inline], [protected], [virtual]`

Get the "High resolution latitude differences" field name

**8.77.3.2** `virtual std::string brathl::CProductEnvisat::GetHighResolutionLonDiffFieldName ( ) [inline], [protected], [virtual]`

Get the "High resolution longitude differences" field name

**8.77.3.3** `bool brathl::CProductEnvisat::IsHighResolutionField ( CField * field ) [protected], [virtual]`

Determines if a field object is a 'high resolution' array data For Envisat, to be a 'high resolution' field, all conditions below have to be true :

- the field object is not an instance of **CFieldBasic** (p. 212)
- the field has one dimension and the dimension is 20.
- the field name is different from the '18 Hz latitude differences from 1 Hz' field (1) and the '18 Hz longitude differences from 1 Hz' field (1)  
(1) if this field are present in the record. Note that only off-line product (product type RA2\_GDR\_2P and RA2\_MWS\_2P have these fields
- the field name contains 'hz18' or '18hz'

## Parameters

<i>field</i>	[in] : field to be tested.
--------------	----------------------------

References `brathl::CTools::StringToLower()`.

**8.77.3.4** `virtual void brathl::CProductEnvisat::SetHighResolutionLatDiffFieldName ( const std::string & value ) [inline], [protected], [virtual]`

Set the "High resolution latitude differences" field name

**8.77.3.5** `virtual void brathl::CProductEnvisat::SetHighResolutionLonDiffFieldName ( const std::string & value ) [inline], [protected], [virtual]`

Set the "High resolution longitude differences" field name

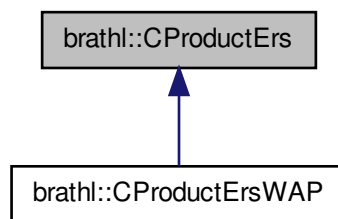
The documentation for this class was generated from the following files:

- ProductEnvisat.h
- ProductEnvisat.cpp

## 8.78 brathl::CProductErs Class Reference

```
#include <ProductErs.h>
```

Inheritance diagram for brathl::CProductErs:



#### Public Member Functions

- **CProductErs** ()  
*Empty CProductErs (p. 272) ctor.*
- **CProductErs** (const std::string &fileName)
- **CProductErs** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()
- virtual ~**CProductErs** ()  
*Destructor.*

#### Static Public Attributes

- static const std::string **m\_WAP** = "ALT.WAP"

#### Protected Member Functions

- virtual void **AddInternalHighResolutionFieldCalculation** ()
- void **ComputeHighResolutionFields** (CDataSet \*dataSet, double deltaLat, double deltaLon)
- virtual void **InitDateRef** ()
- virtual bool **IsHighResolutionField** (CField \*field)
- virtual void **ProcessHighResolutionWithoutFieldCalculation** ()

#### Protected Attributes

- std::string **m\_timeStampMicrosecondFieldName**
- std::string **m\_timeStampSecondFieldName**

#### Additional Inherited Members

##### 8.78.1 Detailed Description

Ers product management class.

Version

1.0

## 8.78.2 Constructor & Destructor Documentation

### 8.78.2.1 brathl::CProductErs::CProductErs ( const std::string & *fileName* )

Creates new **CProductErs** (p. 272) object

Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

### 8.78.2.2 brathl::CProductErs::CProductErs ( const CStringList & *fileNameList* )

Creates new **CProductErs** (p. 272) object

Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.78.3 Member Function Documentation

### 8.78.3.1 bool brathl::CProductErs::IsHighResolutionField ( CField \* *field* ) [protected],[virtual]

Determines if a field object is a 'high resolution' array data For Jason, to be a 'high resolution' field, all conditions below have to be true :

- the field object is not an instance of **CFieldBasic** (p. 212)
- the field has one dimension and the dimension is 10.

Parameters

<i>field</i>	[in] : field to be tested.
--------------	----------------------------

Reimplemented in **brathl::CProductErsWAP** (p. 276).

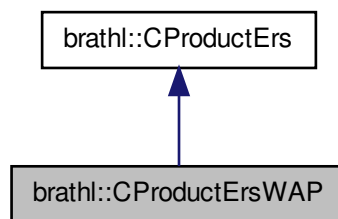
The documentation for this class was generated from the following files:

- ProductErs.h
- ProductErs.cpp

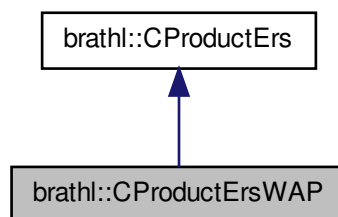
## 8.79 brathl::CProductErsWAP Class Reference

```
#include <ProductErsWAP.h>
```

Inheritance diagram for brathl::CProductErsWAP:



Collaboration diagram for brathl::CProductErsWAP:



#### Public Member Functions

- **CProductErsWAP** ()  
*Empty CProductErsWAP (p. 274) ctor.*
- **CProductErsWAP** (const std::string &fileName)
- **CProductErsWAP** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()
- virtual **~CProductErsWAP** ()  
*Destructor.*

#### Protected Member Functions

- virtual void **AddInternalHighResolutionFieldCalculation** ()
- void **ComputeHighResolutionFields** (CDataSet \*dataSet)
- virtual bool **FindParentToRead** (CField \*fromField, CObList \*parentFieldList)
- virtual void **InitDateRef** ()
- virtual bool **IsDirectHighResolutionField** (CField \*field)
- virtual bool **IsHighResolutionField** (CField \*field)
- virtual void **ProcessHighResolutionWithoutFieldCalculation** ()

## Protected Attributes

- std::string **m\_timeStampDayFieldName**
- std::string **m\_timeStampMicrosecondFieldName**
- std::string **m\_timeStampMillisecondFieldName**

## Additional Inherited Members

## 8.79.1 Detailed Description

Ers product management class.

## Version

1.0

## 8.79.2 Constructor &amp; Destructor Documentation

8.79.2.1 brathl::CProductErsWAP::CProductErsWAP ( const std::string & *fileName* )

Creates new **CProductErsWAP** (p. 274) object

## Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

8.79.2.2 brathl::CProductErsWAP::CProductErsWAP ( const CStringList & *fileNameList* )

Creates new **CProductErsWAP** (p. 274) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.79.3 Member Function Documentation

8.79.3.1 bool brathl::CProductErsWAP::IsHighResolutionField ( CField \* *field* ) [protected], [virtual]

Determines if a field object is a 'high resolution' array data For Jason, to be a 'high resolution' field, all conditions below have to be true :

- the field object is not an instance of **CFieldBasic** (p. 212)
- the field has one dimension and the dimension is 10.

## Parameters

<i>field</i>	[in] : field to be tested.
--------------	----------------------------

Reimplemented from **brathl::CProductErs** (p. 274).

References **brathl::CTools::Format()**.

The documentation for this class was generated from the following files:

- ProductErsWAP.h
- ProductErsWAP.cpp

## 8.80 brathl::CProductGfo Class Reference

```
#include <ProductGfo.h>
```

Inherits brathl::CProduct.

### Public Member Functions

- **CProductGfo** ()  
*Empty CProductGfo (p. 277) ctor.*
- **CProductGfo** (const std::string &fileName)
- **CProductGfo** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()
- virtual ~**CProductGfo** ()  
*Destructor.*

### Protected Member Functions

- virtual void **AddInternalHighResolutionFieldCalculation** ()
- void **ComputeHighResolutionFields** (CDataSet \*dataSet, double deltaLat, double deltaLon)
- virtual void **InitDateRef** ()
- virtual bool **IsHighResolutionField** (CField \*field)
- virtual void **ProcessHighResolutionWithoutFieldCalculation** ()

### Protected Attributes

- std::string **m\_timeStampMicrosecondFieldName**
- std::string **m\_timeStampSecondFieldName**

### Additional Inherited Members

#### 8.80.1 Detailed Description

Ers product management class.

#### Version

1.0

#### 8.80.2 Constructor & Destructor Documentation

##### 8.80.2.1 brathl::CProductGfo::CProductGfo ( const std::string & fileName )

Creates new **CProductGfo** (p. 277) object

#### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

##### 8.80.2.2 brathl::CProductGfo::CProductGfo ( const CStringList & fileNameList )

Creates new **CProductGfo** (p. 277) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.80.3 Member Function Documentation

8.80.3.1 bool brathl::CProductGfo::IsHighResolutionField ( CField \* *field* ) [protected], [virtual]

Determines if a field object is a 'high resolution' array data For Jason, to be a 'high resolution' field, all conditions below have to be true :

- the field object is not an instance of **CFieldBasic** (p.212)
- the field has one dimension and the dimension is 10.

## Parameters

<i>field</i>	[in] : field to be tested.
--------------	----------------------------

The documentation for this class was generated from the following files:

- ProductGfo.h
- ProductGfo.cpp

## 8.81 brathl::CProductJason Class Reference

```
#include <ProductJason.h>
```

Inherits brathl::CProduct.

## Public Member Functions

- **CProductJason** ()  
*Empty CProductJason (p. 278) ctor.*
- **CProductJason** (const std::string &fileName)
- **CProductJason** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()
- virtual ~**CProductJason** ()  
*Destructor.*

## Protected Member Functions

- virtual void **AddInternalHighResolutionFieldCalculation** ()
- void **ComputeHighResolutionFields** (CDataSet \*dataSet, double deltaLat, double deltaLon)
- virtual void **InitDateRef** ()
- virtual bool **IsHighResolutionField** (CField \*field)
- virtual void **ProcessHighResolutionWithoutFieldCalculation** ()

## Protected Attributes

- std::string **m\_timeStampDayFieldName**
- std::string **m\_timeStampMicrosecondFieldName**
- std::string **m\_timeStampSecondFieldName**



## Additional Inherited Members

## 8.81.1 Detailed Description

Jason product management class.

## Version

1.0

## 8.81.2 Constructor &amp; Destructor Documentation

8.81.2.1 brathl::CProductJason::CProductJason ( const std::string & *fileName* )

Creates new **CProductJason** (p. 278) object

## Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

8.81.2.2 brathl::CProductJason::CProductJason ( const CStringList & *fileNameList* )

Creates new **CProductJason** (p. 278) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.81.3 Member Function Documentation

8.81.3.1 bool brathl::CProductJason::IsHighResolutionField ( CField \* *field* ) [protected], [virtual]

Determines if a field object is a 'high resolution' array data For Jason, to be a 'high resolution' field, all conditions below have to be true :

- the field object is not an instance of **CFieldBasic** (p. 212)
- the field has one dimension and the dimension is 20.

## Parameters

<i>field</i>	[in] : field to be tested.
--------------	----------------------------

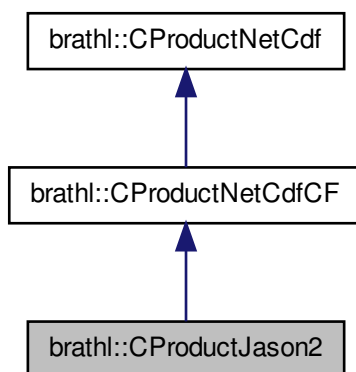
The documentation for this class was generated from the following files:

- ProductJason.h
- ProductJason.cpp

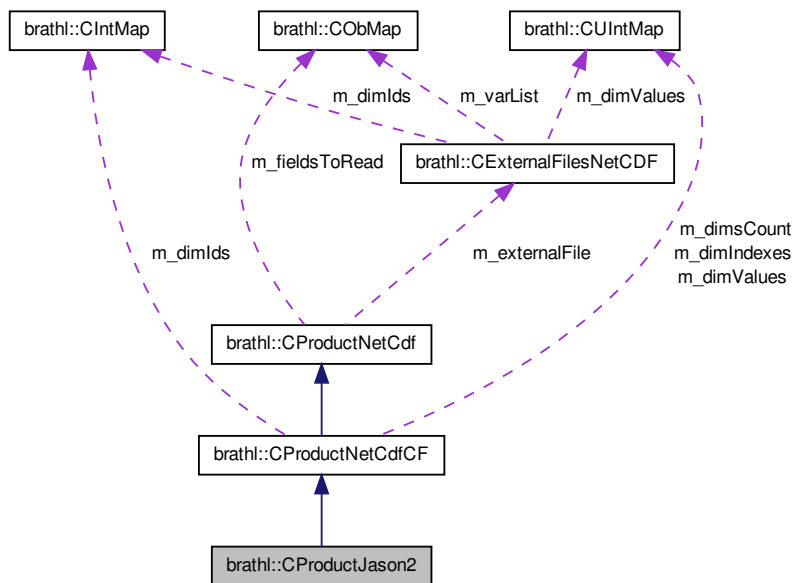
## 8.82 brathl::CProductJason2 Class Reference

```
#include <ProductJason2.h>
```

Inheritance diagram for brathl::CProductJason2:



Collaboration diagram for brathl::CProductJason2:



#### Public Member Functions

- **CProductJason2** ()  
    *CIntMap* (p. 250) ctor.
- **CProductJason2** (const std::string &fileName)
- **CProductJason2** (const **CStringList** &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
    *Dump function.*

- virtual bool **HasCriterialInfo** ()
- virtual void **InitCriterialInfo** ()
- virtual void **InitDateRef** ()

#### Protected Member Functions

- void **Init** ()

#### Additional Inherited Members

##### 8.82.1 Detailed Description

Mapping products management class.

#### Version

1.0

##### 8.82.2 Constructor & Destructor Documentation

###### 8.82.2.1 CProductJason2::CProductJason2 ( const std::string & *fileName* )

Creates new **CProductNetCdf** (p. 283) object

#### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

###### 8.82.2.2 CProductJason2::CProductJason2 ( const CStringList & *fileNameList* )

Creates new **CProductNetCdf** (p. 283) object

#### Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

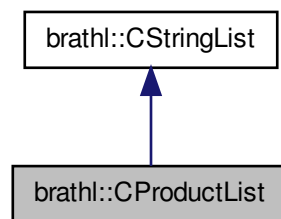
The documentation for this class was generated from the following files:

- ProductJason2.h
- ProductJason2.cpp

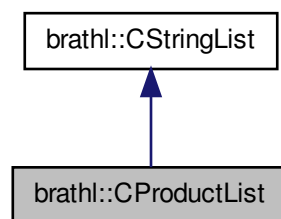
## 8.83 brathl::CProductList Class Reference

```
#include <Product.h>
```

Inheritance diagram for bratl::CProductList:



Collaboration diagram for bratl::CProductList:



#### Public Member Functions

- bool **CheckFiles** (bool onlyFirstFile=false)
- bool **CheckFilesNetCdf** ()
- **CProductList** ()  
*Empty CProductList (p. 281) ctor.*
- **CProductList** (const **CProductList** &p)
- **CProductList** (const std::string &fileName)
- **CProductList** (const **CStringList** &fileNameList)
- **CProductList** (const CStringArray &fileNameArray)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- const std::string & **GetMessage** () const
- bool **IsATP** () const
- bool **IsGenericNetCdf** () const
- bool **IsHdfOrNetcdfCodaFormat** ()
- bool **IsJason2** () const
- bool **IsNetCdfCFProduct** () const
- bool **IsNetCdfOrNetCdfCFProduct** () const
- bool **IsNetCdfProduct** () const
- bool **IsSameProduct** (const std::string &productClass, const std::string &productType)

- bool **IsYFX** ()
- bool **IsZFX** ()
- const **CProductList** & **operator=** (const **CProductList** &lst)
- void **Set** (const **CProductList** &lst)
- virtual ~**CProductList** ()

*Destructor.*

#### Static Public Member Functions

- static bool **IsHdfOrNetcdfCodaFormat** (coda\_format format)

#### Public Attributes

- std::string **m\_message**
- std::string **m\_productClass**
- coda\_format **m\_productFormat**
- std::string **m\_productType**

#### Protected Member Functions

- bool **CheckFileList** ()

#### 8.83.1 Detailed Description

Product file list management class.

#### Version

1.0

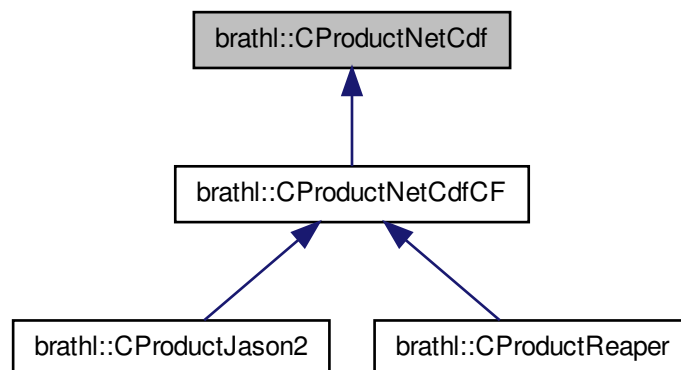
The documentation for this class was generated from the following files:

- Product.h
- Product.cpp

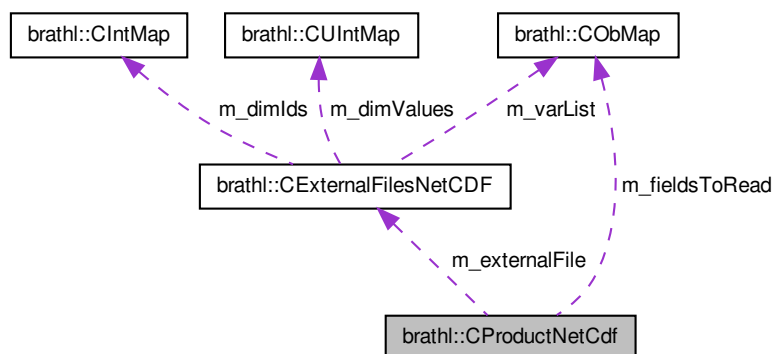
## 8.84 brathl::CProductNetCdf Class Reference

```
#include <ProductNetCdf.h>
```

Inheritance diagram for bratl::CProductNetCdf:



Collaboration diagram for bratl::CProductNetCdf:



#### Public Member Functions

- void **AddDimsToReadOneByOne** (const CStringArray &value)
- virtual void **AddOffset** (double value, CField \*field=NULL)
- virtual void **ApplyCriteria** (CStringList &filteredFileList, const std::string &logFileName="")
- virtual bool **ApplyCriteriaCycle** (CCriterialInfo \*criterialInfo)
- virtual bool **ApplyCriteriaDatetime** (CCriterialInfo \*criterialInfo)
- virtual bool **ApplyCriteriaLatLon** (CCriterialInfo \*criterialInfo)
- virtual bool **ApplyCriteriaPass** (CCriterialInfo \*criterialInfo)
- virtual bool **ApplyCriteriaPassInt** (CCriterialInfo \*criterialInfo)
- virtual bool **ApplyCriteriaPassString** (CCriterialInfo \*criterialInfo)
- virtual void **CheckFileOpened** ()
- virtual CProduct \* **Clone** ()
- virtual bool **Close** ()

- **CProductNetCdf** ()  
*Empty CProductNetCdf (p. 283) ctor.*
- **CProductNetCdf** (const std::string &fileName)
- **CProductNetCdf** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- const CStringArray \* **GetAxisDims** ()
- CStringArray \* **GetComplementDims** ()
- virtual bool **GetDateMinMax** (CDatePeriod &datePeriodMinMax)
- CStringArray \* **GetDimsToReadOneByOne** ()
- **CExternalFilesNetCDF** \* **GetExternalFile** ()
- virtual bool **GetForceReadDataOneByOne** ()
- virtual bool **GetLatLonMinMax** (CLatLonRect &latlonRectMinMax)
- void **GetNetCdfDimensions** (const std::vector< CExpression > &expressions, CStringArray &commonDimNames)
- void **GetNetCdfDimensions** (const CExpression &expr, CStringArray &commonDimNames)
- void **GetNetCdfDimensions** (const CStringArray &fields, CStringArray &commonDimNames)
- void **GetNetCdfDimensions** (const std::vector< CExpression > &expressions, CStringArray &commonDimNames, const std::string &recordName)
- void **GetNetCdfDimensions** (const CExpression &expr, CStringArray &commonDimNames, const std::string &recordName)
- void **GetNetCdfDimensions** (const CStringArray &fields, CStringArray &commonDimNames, const std::string &recordName)
- void **GetNetCdfDimensionsWithoutAlgo** (const std::vector< CExpression > &expressions, CStringArray &commonDimNames, const std::string &recordName)
- void **GetNetCdfDimensionsWithoutAlgo** (const CExpression &expr, CStringArray &commonDimNames, const std::string &recordName)
- virtual int32\_t **GetNumberOfRecords** (const std::string &dataSetName)
- virtual int32\_t **GetNumberOfRecords** ()
- virtual void **GetRecords** (CStringArray &array)
- virtual bool **HasCriteriaInfo** ()
- virtual void **InitCriteriaInfo** ()
- void **InitDataset** ()
- virtual void **InitDateRef** ()
- void **InitLatLonFieldName** ()
- bool **IsApplyNetcdfProductInitialisation** ()
- bool **IsLatField** (CFieldNetCdf \*field)
- bool **IsLonField** (CFieldNetCdf \*field)
- virtual bool **IsOpened** ()
- virtual bool **IsOpened** (const std::string &fileName)
- void **MustBeOpened** ()
- virtual void **NetCdfProductInitialization** (CProduct \*from)
- virtual bool **NextRecord** ()
- virtual bool **Open** (const std::string &fileName, const std::string &dataSetName, CStringList &listFieldToRead)
- virtual bool **Open** (const std::string &fileName, const std::string &dataSetName)
- virtual bool **Open** (const std::string &fileName)
- virtual bool **PrevRecord** ()
- virtual void **ReadBratRecord** (int32\_t iRecord)
- **CFieldNetCdf** \* **ReadDateCriteriaValue** (CFieldInfo &fieldInfo, CDate &date, bool wantMin=true)
- **CFieldNetCdf** \* **ReadDoubleCriteriaValue** (CFieldInfo &fieldInfo, double &value, bool wantMin=true)
- virtual void **Rewind** ()
- void **SetApplyNetcdfProductInitialisation** (bool value)
- void **SetAxisDims** (const CStringArray &value)
- void **SetComplementDims** (const CStringArray &value)

- void **SetDimsToReadOneByOne** (const CStringArray &value)
- virtual void **SetForceReadDataOneByOne** (bool value)
- virtual void **SetOffset** (double value)
- virtual **~CProductNetCdf** ()

*Destructor.*

#### Static Public Member Functions

- static **CProductNetCdf \* GetProductNetCdf** (CBratObject \*ob, bool withExcept=true)
- static bool **IsProductNetCdf** (CBratObject \*ob)

#### Static Public Attributes

- static const std::string **m\_virtualRecordName** = "data"

#### Protected Member Functions

- virtual void **CreateFieldSets** ()
- void **DeleteExternalFile** ()
- void **DeleteFieldsToReadMap** ()
- virtual void **FillDescription** ()
- **CFieldNetCdf \* FindCycleField** ()
- **CFieldNetCdf \* FindLatField** ()
- **CFieldNetCdf \* FindLonField** ()
- **CFieldNetCdf \* FindPassField** ()
- **CFieldNetCdf \* FindTimeField** ()
- void **Init** ()
- virtual void **InitInternalFieldName** (const std::string &dataSetName, **CStringList** &listField, bool convertDate=false)
- virtual void **InitInternalFieldName** (**CStringList** &listField, bool convertDate=false)
- virtual void **LoadFieldsInfo** ()
- virtual std::string **MakeInternalFieldName** (const std::string &dataSetName, const std::string &field)
- virtual std::string **MakeInternalFieldName** (const std::string &field)
- virtual bool **Open** ()
- virtual **CFieldNetCdf \* Read** (CFieldInfo &fieldInfo, double &value, bool wantMin=true)
- virtual void **Read** (CFieldInfo &fieldInfo, std::string &value)
- virtual void **Read** (**CFieldNetCdf \*field**, double &value)
- virtual void **Read** (**CFieldNetCdf \*field**, CDoubleArray &vect)
- virtual void **Read** (**CFieldNetCdf \*field**, **CExpressionValue** &value)
- virtual void **ReadAll** (**CFieldNetCdf \*field**)
- virtual void **ReadAll** (**CFieldNetCdf \*field**, **CExpressionValue** &value)
- virtual void **ReadBratFieldRecord** (const std::string &key)
- virtual void **ReadBratFieldRecord** (CField::CListField::iterator it)
- virtual void **RewindEnd** ()
- virtual void **RewindInit** ()
- virtual void **RewindProcess** ()

#### Protected Attributes

- bool **m\_applyNetcdfProductInitialisation**
- CStringArray **m\_axisDims**
- CStringArray **m\_complementDims**
- CStringArray **m\_dimsToReadOneByOne**
- **CExternalFilesNetCDF \* m\_externalFile**
- **CObMap \* m\_fieldsToRead**
- bool **m\_forceReadDataOneByOne**



## 8.84.1 Detailed Description

Netcdf product management class.

Version

1.0

## 8.84.2 Constructor &amp; Destructor Documentation

8.84.2.1 brathl::CProductNetCdf::CProductNetCdf ( const std::string & *fileName* )

Creates new **CProductNetCdf** (p. 283) object

Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

8.84.2.2 brathl::CProductNetCdf::CProductNetCdf ( const CStringList & *fileNameList* )

Creates new **CProductNetCdf** (p. 283) object

Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.84.3 Member Data Documentation

## 8.84.3.1 CObMap\* brathl::CProductNetCdf::m\_fieldsToRead [protected]

Map of the fields to read (key : var name → **CFieldNetCdf** (p. 216) object) NB : **CFieldNetCdf** (p. 216) objects stored in this map have not to be delete (they are not a copy !!!)

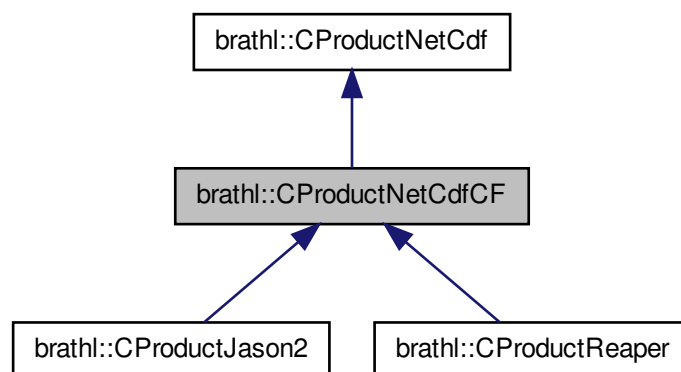
The documentation for this class was generated from the following files:

- ProductNetCdf.h
- ProductNetCdf.cpp

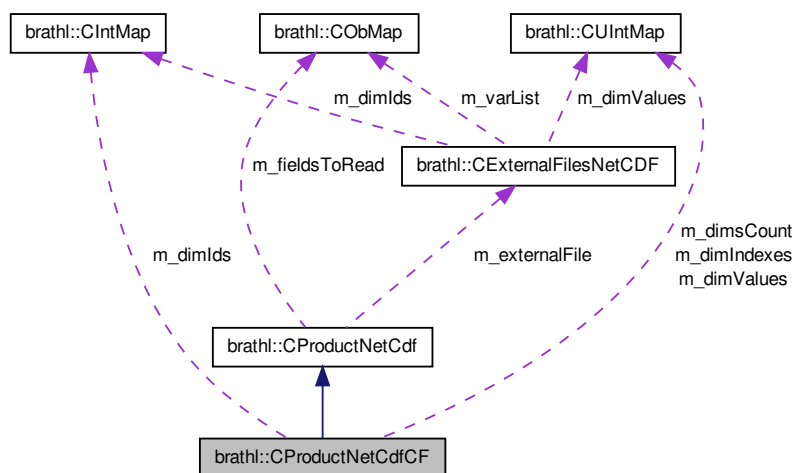
## 8.85 brathl::CProductNetCdfCF Class Reference

```
#include <ProductNetCdfCF.h>
```

Inheritance diagram for brathl::CProductNetCdfCF:



Collaboration diagram for brathl::CProductNetCdfCF:



#### Public Member Functions

- virtual `CProduct *` **Clone** ()
- **CProductNetCdfCF** ()  
Empty *CProductNetCdf* (p. 283) ctor.
- **CProductNetCdfCF** (const std::string &fileName)
- **CProductNetCdfCF** (const **CStringList** &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
Dump fonction.
- virtual int32\_t **GetNumberOfRecords** (const std::string &dataSetName)
- virtual int32\_t **GetNumberOfRecords** ()

- virtual bool **NextRecord** ()
- virtual bool **PrevRecord** ()
- virtual void **Rewind** ()
- virtual **~CProductNetCdfCF** ()

*Destructor.*

#### Static Public Member Functions

- static **CProductNetCdfCF \* GetProductNetCdfCF** (CBratObject \*ob, bool withExcept=true)
- static bool **IsProductNetCdfCF** (CBratObject \*ob)

#### Protected Member Functions

- void **AdjustIndexesFromField** (CFieldNetCdf \*field, bool next=true)
- void **AdjustIndexesToMin** (bool next=true)
- void **AdjustIndexesToMin** (CFieldNetCdf \*field, bool next=true)
- bool **CheckEOF** ()
- void **Init** ()
- void **InitDimIndexes** (uint32\_t value)
- virtual void **InitDimsIndexToMax** ()
- bool **IsAtBeginning** ()
- bool **NextFieldIndex** ()
- bool **PrevFieldIndex** ()
- virtual void **RewindEnd** ()
- virtual void **RewindInit** ()
- virtual void **RewindProcess** ()
- void **SetFieldIndex** ()
- void **SetFieldIndex** (CFieldNetCdf \*field)

#### Protected Attributes

- bool **m\_atBeginning**
- CIntMap **m\_dimIds**
- CUIntMap **m\_dimIndexes**
- CUIntMap **m\_dimsCount**
- CUIntMap **m\_dimValues**

#### Additional Inherited Members

##### 8.85.1 Detailed Description

Netcdf product management class.

#### Version

1.0

##### 8.85.2 Constructor & Destructor Documentation

###### 8.85.2.1 bratl::CProductNetCdfCF::CProductNetCdfCF ( const std::string & fileName )

Creates new **CProductNetCdf** (p. 283) object

#### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

### 8.85.2.2 brathl::CProductNetCdfCF::CProductNetCdfCF ( const CStringList & fileNameList )

Creates new **CProductNetCdf** (p. 283) object

#### Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.85.3 Member Data Documentation

### 8.85.3.1 bool brathl::CProductNetCdfCF::m\_atBeginning [protected]

'At beginning" flag

Referenced by Dump().

### 8.85.3.2 CIntMap brathl::CProductNetCdfCF::m\_dimIds [protected]

Map of the dimension's ids of the read fields (key : dim name → dim ids)

Referenced by Dump().

### 8.85.3.3 CUIntMap brathl::CProductNetCdfCF::m\_dimsCount [protected]

Map of the dimension's ranges of the read fields (key : dim name → dim range)Array of the dimension count for reading (key : dim name → count)

Referenced by Dump().

### 8.85.3.4 CUIntMap brathl::CProductNetCdfCF::m\_dimValues [protected]

Map of the dimension's values of the read fields (key : dim name → dim value)

Referenced by Dump().

The documentation for this class was generated from the following files:

- ProductNetCdfCF.h
- ProductNetCdfCF.cpp

## 8.86 brathl::CProductPodaac Class Reference

```
#include <ProductPodaac.h>
```

Inherits brathl::CProduct.

#### Public Member Functions

- **CProductPodaac** ()  
*Empty CProductPodaac (p. 290) ctor.*
- **CProductPodaac** (const std::string &fileName)
- **CProductPodaac** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual std::string **GetLabel** ()
- virtual void **InitCriteriaInfo** ()

- virtual `~CProductPodaac ()`  
*Destructor.*

#### Static Public Attributes

- static const std::string `m_J1SSHA_ATG_FILE` = "J1SSHA\_ATG\_FILE"
- static const std::string `m_J1SSHA_PASS_FILE` = "J1SSHA\_PASS\_FILE"
- static const std::string `m_TPSSHA_ATG_FILE` = "TPSSHA\_ATG\_FILE"
- static const std::string `m_TPSSHA_PASS_FILE` = "TPSSHA\_PASS\_FILE"

#### Protected Member Functions

- virtual void `InitDateRef ()`

#### Additional Inherited Members

##### 8.86.1 Detailed Description

Ers product management class.

#### Version

1.0

##### 8.86.2 Constructor & Destructor Documentation

###### 8.86.2.1 brathl::CProductPodaac::CProductPodaac ( const std::string & *fileName* )

Creates new **CProductPodaac** (p. 290) object

#### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

###### 8.86.2.2 brathl::CProductPodaac::CProductPodaac ( const CStringList & *fileNameList* )

Creates new **CProductPodaac** (p. 290) object

#### Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

The documentation for this class was generated from the following files:

- ProductPodaac.h
- ProductPodaac.cpp

## 8.87 brathl::CProductRads Class Reference

```
#include <ProductRads.h>
```

Inherits brathl::CProduct.

## Public Member Functions

- **CProductRads** ()  
*Empty CProductRads (p. 291) ctor.*
- **CProductRads** (const std::string &fileName)
- **CProductRads** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()
- virtual ~**CProductRads** ()  
*Destructor.*

## Protected Member Functions

- virtual void **InitDateRef** ()

## Additional Inherited Members

## 8.87.1 Detailed Description

RADS product management class.

## Version

1.0

## 8.87.2 Constructor &amp; Destructor Documentation

## 8.87.2.1 brathl::CProductRads::CProductRads ( const std::string &amp; fileName )

Creates new **CProductRads** (p. 291) object

## Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

## 8.87.2.2 brathl::CProductRads::CProductRads ( const CStringList &amp; fileNameList )

Creates new **CProductRads** (p. 291) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

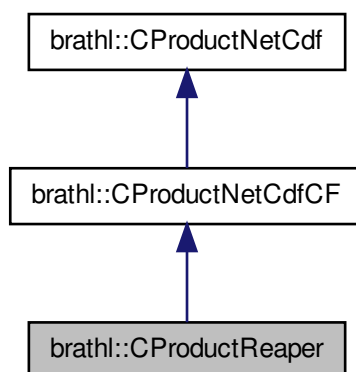
The documentation for this class was generated from the following files:

- ProductRads.h
- ProductRads.cpp

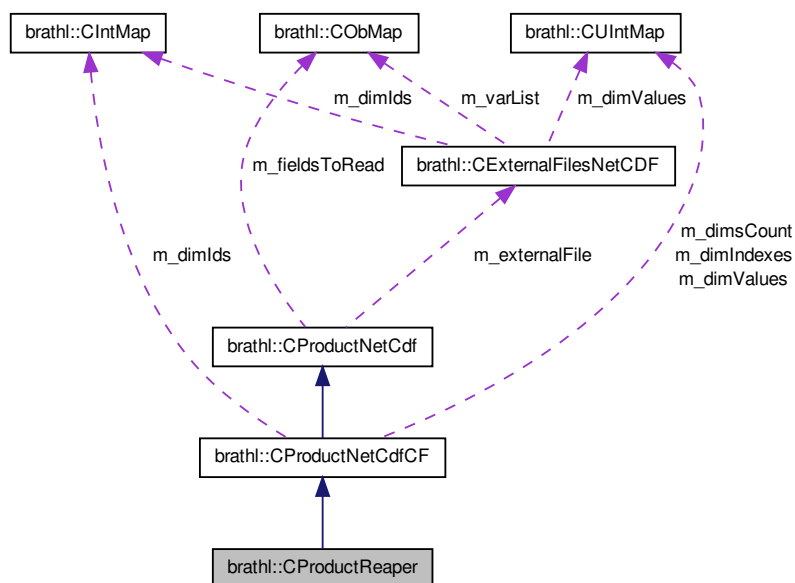
## 8.88 brathl::CProductReaper Class Reference

```
#include <ProductReaper.h>
```

Inheritance diagram for brathl::CProductReaper:



Collaboration diagram for brathl::CProductReaper:



#### Public Member Functions

- **CProductReaper** ()  
*Empty CProductReaper (p. 292) ctor.*
- **CProductReaper** (const std::string &path)
- **CProductReaper** (const CStringList &paths)
- virtual void **InitDateRef** ()
- virtual ~**CProductReaper** ()

*Destructor.*

## Additional Inherited Members

### 8.88.1 Detailed Description

Reaper product management class.

#### Version

1.0

### 8.88.2 Constructor & Destructor Documentation

#### 8.88.2.1 brathl::CProductReaper::CProductReaper ( const std::string & *path* ) [inline]

Creates new **CProductReaper** (p. 292) object

##### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

#### 8.88.2.2 brathl::CProductReaper::CProductReaper ( const CStringList & *paths* ) [inline]

Creates new **CProductReaper** (p. 292) object

##### Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

The documentation for this class was generated from the following file:

- ProductReaper.h

## 8.89 brathl::CProductRiverLake Class Reference

```
#include <ProductRiverLake.h>
```

Inherits brathl::CProduct.

### Public Member Functions

- **CProductRiverLake** ()  
*Empty CProductRiverLake (p. 294) ctor.*
- **CProductRiverLake** (const std::string &fileName)
- **CProductRiverLake** (const **CStringList** &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- virtual void **InitCriteriaInfo** ()
- virtual **~CProductRiverLake** ()  
*Destructor.*

### Protected Member Functions

- virtual void **InitDateRef** ()



## Additional Inherited Members

## 8.89.1 Detailed Description

River & Lake product management class.

## Version

1.0

## 8.89.2 Constructor &amp; Destructor Documentation

8.89.2.1 bratl::CProductRiverLake::CProductRiverLake ( const std::string & *fileName* )

Creates new **CProductRiverLake** (p. 294) object

## Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

8.89.2.2 bratl::CProductRiverLake::CProductRiverLake ( const CStringList & *fileNameList* )

Creates new **CProductRiverLake** (p. 294) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

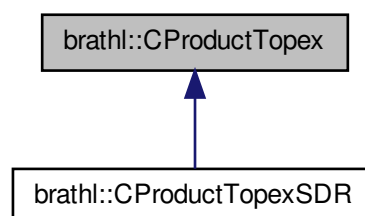
The documentation for this class was generated from the following files:

- ProductRiverLake.h
- ProductRiverLake.cpp

## 8.90 bratl::CProductTopex Class Reference

```
#include <ProductTopex.h>
```

Inheritance diagram for bratl::CProductTopex:



## Public Member Functions

- **CProductTopex** ()

Empty **CProductTopex** (p. 295) ctor.

- **CProductTopex** (const std::string &fileName)
- **CProductTopex** (const **CStringList** &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)

Dump function.

- virtual std::string **GetLabel** ()
- virtual void **InitCriteriaInfo** ()
- virtual ~**CProductTopex** ()

Destructor.

#### Static Public Attributes

- static const int32\_t **m\_ALTIMETER\_POSEIDON** = 0
- static const int32\_t **m\_ALTIMETER\_TOPEX** = 1
- static const std::string **m\_PASS\_FILE** = "MGDR\_pass\_file"
- static const std::string **m\_SDR\_PASS\_FILE** = "SDR\_pass\_file"
- static const std::string **m\_TOPEX\_POSEIDON\_HEADER** = "header"
- static const std::string **m\_XNG\_FILE** = "MGDR\_crossover\_point\_file"

#### Protected Member Functions

- virtual void **AddInternalHighResolutionFieldCalculation** ()
- void **ComputeHighResolutionFields** (**CDataSet** \*dataSet, double deltaLat, double deltaLon)
- virtual void **InitDateRef** ()
- virtual bool **IsHighResolutionField** (**CField** \*field)
- virtual void **ProcessHighResolutionWithoutFieldCalculation** ()
- virtual void **SetDeltaTimeHighResolution** (int32\_t altimeterIndicator)

#### Protected Attributes

- std::string **m\_altimeterIndicatorFieldName**
- std::string **m\_timeStampDayFieldName**
- std::string **m\_timeStampMicrosecondFieldName**
- std::string **m\_timeStampMillisecondFieldName**

#### Additional Inherited Members

##### 8.90.1 Detailed Description

Topex/Poseidon product management class.

#### Version

1.0

##### 8.90.2 Constructor & Destructor Documentation

###### 8.90.2.1 brathl::CProductTopex::CProductTopex ( const std::string & fileName )

Creates new **CProductTopex** (p. 295) object

#### Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

## 8.90.2.2 bratl::CProductTopex::CProductTopex ( const CStringList &amp; fileNameList )

Creates new **CProductTopex** (p. 295) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.90.3 Member Function Documentation

## 8.90.3.1 bool bratl::CProductTopex::IsHighResolutionField ( CField \* field ) [protected], [virtual]

Determines if a field object is a 'high resolution' array data For Topex/Poseidon, to be a 'high resolution' field, all conditions below have to be true :

- the field object is not an instance of **CFieldBasic** (p. 212)
- the field has one dimension and the dimension is 10.

## Parameters

<i>field</i>	[in] : field to be tested.
--------------	----------------------------

Reimplemented in **bratl::CProductTopexSDR** (p. 299).

## 8.90.4 Member Data Documentation

## 8.90.4.1 const int32\_t bratl::CProductTopex::m\_ALTIMETER\_POSEIDON = 0 [static]

Altimeter Indicator. This element is computed for TOPEX and POSEIDON data. It indicates which altimeter is on at the time of the measurement. Value Definition: 0 = POSEIDON on, 1 = TOPEX on

## 8.90.4.2 std::string bratl::CProductTopex::m\_altimeterIndicatorFieldName [protected]

Altimeter Indicator. This element is computed for TOPEX and POSEIDON data. It indicates which altimeter is on at the time of the measurement. Value Definition: 0 = POSEIDON on, 1 = TOPEX on

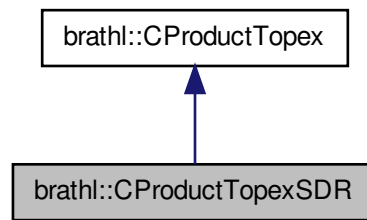
The documentation for this class was generated from the following files:

- ProductTopex.h
- ProductTopex.cpp

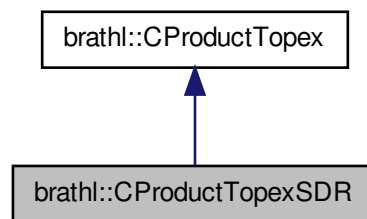
## 8.91 bratl::CProductTopexSDR Class Reference

```
#include <ProductTopexSDR.h>
```

Inheritance diagram for bratl::CProductTopexSDR:



Collaboration diagram for bratl::CProductTopexSDR:



#### Public Member Functions

- **CProductTopexSDR** ()  
*Empty CProductTopexSDR (p. 297) ctor.*
- **CProductTopexSDR** (const std::string &fileName)
- **CProductTopexSDR** (const CStringList &fileNameList)
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- virtual std::string **GetLabel** ()
- virtual ~**CProductTopexSDR** ()  
*Destructor.*

#### Protected Member Functions

- virtual void **CheckConsistencyHighResolutionField** (CFieldSetArrayDbI \*fieldSetArrayDbI)
- void **ComputeHighResolutionFields** (CDataSet \*dataSet, double deltaLat, double deltaLon)
- virtual bool **IsHighResolutionField** (CField \*field)
- virtual void **ProcessHighResolutionWithoutFieldCalculation** ()
- virtual void **PutFlatHighResolution** (CDataSet \*dataSet, CFieldSetArrayDbI \*fieldSetArrayDbI)
- virtual void **SetHighResolution** (CField \*field)

## Protected Attributes

- uint32\_t **m\_highRateNumHighResolutionMeasure**
- uint32\_t **m\_lowRateNumHighResolutionMeasure**

## Additional Inherited Members

## 8.91.1 Detailed Description

Topex/Poseidon SDR product management class.

## Version

1.0

## 8.91.2 Constructor &amp; Destructor Documentation

8.91.2.1 brathl::CProductTopexSDR::CProductTopexSDR ( const std::string & *fileName* )

Creates new **CProductTopexSDR** (p. 297) object

## Parameters

<i>fileName</i>	[in] : file name to be connected
-----------------	----------------------------------

8.91.2.2 brathl::CProductTopexSDR::CProductTopexSDR ( const CStringList & *fileNameList* )

Creates new **CProductTopexSDR** (p. 297) object

## Parameters

<i>fileNameList</i>	[in] : list of file to be connected
---------------------	-------------------------------------

## 8.91.3 Member Function Documentation

8.91.3.1 bool brathl::CProductTopexSDR::IsHighResolutionField ( CField \* *field* ) [protected], [virtual]

Determines if a field object is a 'high resolution' array data For Topex/Poseidon, to be a 'high resolution' field, all conditions below have to be true :

- **CProductTopex** (p. 295) rules (see **CProductTopex::IsHighResolutionField** (p. 297))
- the field has two dimensions and the first dimension is 10 or 5.

## Parameters

<i>field</i>	[in] : field to be tested.
--------------	----------------------------

Reimplemented from **brathl::CProductTopex** (p. 297).

The documentation for this class was generated from the following files:

- ProductTopexSDR.h
- ProductTopexSDR.cpp

## 8.92 brathl::CPtrMap Class Reference

```
#include <List.h>
```

## Public Member Functions

- **CPtrMap** (bool bDelete=true)  
*CPtrMap* (p. 299) *ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump function.*
- virtual bool **Erase** (CPtrMap::iterator it)
- virtual bool **Erase** (const std::string &key)
- virtual void \* **Exists** (const std::string &key) const
- virtual void \* **Insert** (const std::string &key, void \*ptr, bool withExcept=true)
- virtual void **Insert** (const **CPtrMap** &ptrMap, bool withExcept=true)
- virtual void \* **operator[]** (const std::string &key)
- virtual void **RemoveAll** ()
- virtual ~**CPtrMap** ()  
*CPtrMap* (p. 299) *dtor.*

## Protected Attributes

- bool **m\_bDelete**

## 8.92.1 Detailed Description

a set of pointer management classes.

## Version

1.0

The documentation for this class was generated from the following files:

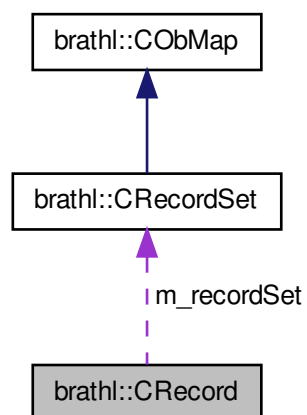
- List.h
- List.cpp

## 8.93 brathl::CRecord Class Reference

```
#include <Field.h>
```

Inherits brathl::CBratObject.

Collaboration diagram for bratl::CRecord:



#### Public Member Functions

- **CRecord** (**CRecordSet** \*recordSet=NULL)  
*Ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump fonction.*
- const std::string & **GetName** ()
- **CRecordSet** \* **GetRecordSet** ()
- virtual ~**CRecord** ()  
*Dtor.*

#### Protected Attributes

- **CRecordSet** \* **m\_recordSet**

#### 8.93.1 Detailed Description

a set of record management classes.

#### Version

1.0

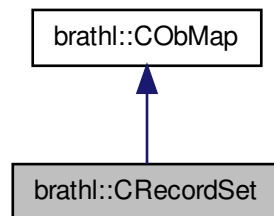
The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

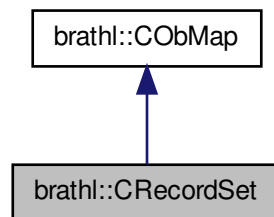
## 8.94 brathl::CRecordSet Class Reference

```
#include <Field.h>
```

Inheritance diagram for brathl::CRecordSet:



Collaboration diagram for brathl::CRecordSet:



## Public Member Functions

- **CRecordSet** (const std::string &name="", bool bDelete=true)  
*Ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- void **ExecuteExpression** (CExpression &expr, const std::string &recordName, **CExpressionValue** &expr-Value, CProduct \*product=NULL)
- **CFieldSet** \* **ExistsFieldSet** (const std::string &key)
- **CField** \* **GetField** (CRecordSet::iterator it)
- **CFieldSet** \* **GetFieldSet** (CRecordSet::iterator it)
- **CFieldSet** \* **GetFieldSet** (const std::string &dataSetName, const std::string &fieldName)
- bool **IsFieldHasToBeExpanded** (CRecordSet::iterator it, const **CStringList** &listFieldExpandArray)
- bool **IsFieldHasToBeExpanded** (**CFieldSet** \*fieldSet, const **CStringList** &listFieldExpandArray)
- virtual ~**CRecordSet** ()  
*Dtor.*



#### Public Attributes

- std::string **m\_name**

#### Additional Inherited Members

##### 8.94.1 Detailed Description

a set of record fields value management classes.

#### Version

1.0

The documentation for this class was generated from the following files:

- Field.h
- Field.cpp

## 8.95 brathl::CRegisteredPass Class Reference

```
#include <ExternalFilesATP.h>
```

Inherits brathl::CBratObject.

#### Public Member Functions

- **CRegisteredPass** (**CRegisteredPass** &p)
- const **CRegisteredPass** & **operator=** (**CRegisteredPass** &p)
- void **Set** (**CRegisteredPass** &p)

#### Public Attributes

- double **m\_beginDate**
- uint32\_t **m\_cycle**
- uint32\_t **m\_cycleIndex**
- uint32\_t **m\_nbData**
- uint32\_t **m\_pass**
- uint32\_t **m\_startPoint**

##### 8.95.1 Detailed Description

External files access.

#### Version

1.0

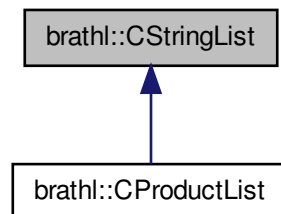
The documentation for this class was generated from the following file:

- ExternalFilesATP.h

## 8.96 bratl::CStringList Class Reference

```
#include <List.h>
```

Inheritance diagram for bratl::CStringList:



## Public Member Functions

- virtual bool **Complement** (const **CStringList** &array, **CStringList** &complement) const
- **CStringList** ()
  - Empty CStringList (p. 304) ctor.*
- **CStringList** (const **CStringList** &list)
- **CStringList** (const **stringlist** &list)
- **CStringList** (const CStringArray &vect)
- **CStringList** (const **stringarray** &vect)
- virtual void **Dump** (std::ostream &fOut=std::cerr) const
  - Dump function.*
- virtual void **Erase** (const std::string &str)
- virtual void **Erase** (CStringList::iterator it)
- virtual bool **Exists** (const std::string &str) const
- virtual bool **ExistsNoCase** (const std::string &str) const
- virtual void **ExtractKeys** (const std::string &str, const std::string &delim, bool bRemoveAll=true)
- virtual void **ExtractStrings** (const std::string &str, const char delim, bool bRemoveAll=true)
- virtual void **ExtractStrings** (const std::string &str, const std::string &delim, bool bRemoveAll=true)
- virtual int32\_t **FindIndex** (const std::string &str, bool compareNoCase=false) const
- virtual void **Insert** (const **CStringList** &list, bool bEnd=true)
- virtual void **Insert** (const std::string &str, bool bEnd=true)
- virtual void **Insert** (const CStringArray &vect, bool bEnd=true)
- virtual void **Insert** (const **stringarray** &vect, bool bEnd=true)
- virtual void **Insert** (const **stringlist** &lst, bool bEnd=true)
- virtual void **InsertUnique** (const std::string &str, bool bEnd=true)
- virtual void **InsertUnique** (const **CStringList** &lst, bool bEnd=true)
- virtual void **InsertUnique** (const CStringArray \*vect, bool bEnd=true)
- virtual void **InsertUnique** (const CStringArray &vect, bool bEnd=true)
- virtual void **InsertUnique** (const **stringarray** &vect, bool bEnd=true)
- virtual void **InsertUnique** (const **stringlist** &lst, bool bEnd=true)
- virtual bool **Intersect** (const **CStringList** &array, **CStringList** &intersect) const
- virtual const **CStringList** & **operator=** (const **CStringList** &lst)
- virtual const **CStringList** & **operator=** (const CStringArray &vect)
- virtual const **CStringList** & **operator=** (const **stringarray** &vect)

- virtual const **CStringList** & **operator=** (const **stringlist** &lst)
- virtual void **RemoveAll** ()
- virtual std::string **ToString** (const std::string &delim=",", bool useBracket=true) const
- virtual ~**CStringList** ()

*Destructor.*

#### 8.96.1 Detailed Description

A std::list of strings management class.

##### Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.97 brathl::CStringMap Class Reference

```
#include <List.h>
```

### Public Member Functions

- **CStringMap** ()  
*CStringMap* (p. 305) ctor.
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual bool **Erase** (CStringMap::iterator it)
- virtual bool **Erase** (const std::string &key)
- virtual std::string **Exists** (const std::string &key) const
- virtual void **GetKeys** (CStringArray &keys, bool bRemoveAll=true) const
- virtual std::string **Insert** (const std::string &key, const std::string &str, bool withExcept=true)
- virtual void **Insert** (const **CStringMap** &strmap, bool withExcept=true)
- virtual std::string **IsValue** (const std::string &value)
- virtual void **RemoveAll** ()
- virtual ~**CStringMap** ()  
*CStringMap* (p. 305) dtor.

#### 8.97.1 Detailed Description

a set of std::string value management classes.

##### Version

1.0

The documentation for this class was generated from the following files:

- List.h
- List.cpp

## 8.98 brathl::CTools Class Reference

```
#include <Tools.h>
```

## Static Public Member Functions

- static double **Abs** (double X)
- static std::string **AbsolutePath** (const std::string &partialPath)
- static double **ACos** (double X)
- static double **ACosD** (double X)
- static double **And** (double X, double Y)
- static bool **AreValidMercatorLatitude** (double lat)
- static std::string **BeforeFirst** (const std::string &str, const char ch)
- static double **BitwiseAnd** (double X, double Y)
- static double **BitwiseNot** (double X)
- static double **BitwiseOr** (double X, double Y)
- static bool **CastValue** (int32\_t &Dest, const double Source)
- static double **Ceil** (double X)
- static int **Compare** (double X, double Y, double compareEpsilon=CTools::m\_CompareEpsilon)
- static bool **Compare** (const char \*str1, const char \*str2)
- static double **Cos** (double X)
- static double **CosD** (double X)
- static double **Deg2Rad** (double X)
- static bool **DirectoryExists** (const std::string &Name)
- static double **DistanceKmOnUnitSphere** (double lat1, double long1, double lat2, double long2)
- static double **DistanceOnUnitSphere** (double lat1, double long1, double lat2, double long2)
- static double **Divide** (double X, double Y)
- static void **DoIncrementalStats** (double NewValue, double &Count, double &Mean, double &StdDev, double &Min, double &Max)
- static std::string **DoubleToStr** (double d, int32\_t precision=10)
- static double **Exp** (double X)
- static std::string **ExpandShellVar** (const std::string &value)
- static std::string **ExpandVariables** (const std::string &valueIn, const std::map< std::string, std::string > \*varValues, bool recurse=false, char beginning= '%', uint32\_t \*numberVarsExpanded=NULL, bool withExcept=false, std::string \*errorMsg=NULL)
- static std::string **ExpandVariables** (const std::string &valueIn, const std::map< std::string, std::string > \*varValues, const std::map< std::string, std::string > \*fieldAliases, bool recurse=false, char beginning= '%', uint32\_t \*numberVarsExpanded=NULL, bool withExcept=false, std::string \*errorMsg=NULL)
- static void **ExtractVector** (const double \*vectorIn, uint32\_t \*shape, uint32\_t nDims, uint32\_t \*start, uint32\_t \*edges, double \*vectorOut)
- static bool **FileExists** (const std::string &Name)
- static std::string **FileExtension** (const std::string &fileName)
- static void **FinalizeIncrementalStats** (double Count, double &Mean, double &StdDev, double &Min, double &Max, double DefaultValue=m\_defaultValueDOUBLE)
- static void **Find** (const std::string &inText, const std::string &regexPattern, std::vector< std::string > &stringFound)
- static void **FindAliases** (const std::string &inText, std::vector< std::string > &aliasesFound, bool onlyName=false, const std::string &beginning="%", bool recurse=false, const std::map< std::string, std::string > \*varValues=NULL, const std::map< std::string, std::string > \*fieldAliases=NULL, bool withExcept=false, std::string \*errorMsg=NULL)
- static std::string **FindDataFile** (const std::string &Name)
- static std::string **FindFileInPath** (const std::string &filename, const std::string &path)
- static int32\_t **FindNoCase** (const std::string &src, const std::string &findWhat, uint32\_t pos=0)
- static int32\_t **FindNoCase** (const char \*src, const char \*findWhat, uint32\_t pos=0)
- static void **FindWord** (const std::string &inText, std::vector< std::string > &wordsFound)

- static std::string **FloatToStr** (float f, int32\_t precision=10)
- static double **Floor** (double X)
- static int32\_t static std::string **Format** (size\_t size, const char \*format,...) \_\_attribute\_\_((format(printf
- static int32\_t static std::string static std::string **Format** (const char \*format,...) \_\_attribute\_\_((format(printf
- static int32\_t static std::string static std::string static std::string **Format** (size\_t size, const char \*format, va\_list args)
- static double **Frac** (double value)
- static std::string **GetInternalDataDir** ()
- static uint32\_t **GetProductValues** (uint32\_t \*shape, uint32\_t nbDims)
- static double **Int** (double dValue)
- static std::string **IntToStr** (int32\_t i)
- static double **IsBounded** (double **Min**, double X, double **Max**)
- static double **IsBoundedStrict** (double **Min**, double X, double **Max**)
- static double **IsDefaultFloat** (double X)
- static bool **IsEmpty** (const char \*pstrString)
- static bool **IsEven** (uint32\_t value)
- static bool **IsEven** (int32\_t value)
- static int **IsInf** (double X)
- static bool **IsLongitudeCircular** (double min, double max, double compareEpsilon=CTools::m\_CompareEpsilon)
- static int **IsNan** (double X)
- static bool **IsOdd** (uint32\_t value)
- static bool **IsOdd** (int32\_t value)
- static bool **LoadAndCheckUdUnitsSystem** (std::string &errorMsg)
- static double **Log** (double X)
- static double **Log10** (double X)
- static std::string **LongToStr** (int64\_t i)
- static std::string **MakeCorrectPath** (const std::string &path)
- static double **Max** (double X1, double X2)
- static double **Min** (double X1, double X2)
- static double **Minus** (double X, double Y)
- static double **Mod** (double X, double Y)
- static double **Multiply** (double X, double Y)
- static double **NormalizeLongitude** (double **Floor**, double Longitude)
- static double **Or** (double X, double Y)
- static double **Plus** (double X, double Y)
- static double **Pow** (double X, double Y)
- static double **Rad2Deg** (double X)
- static char \* **RemoveAllSpaces** (char \*str)
- static std::string **RemoveCharSurroundingNumber** (const std::string &str, const char c1='(', const char c2=')')
- static std::string **Replace** (const std::string &inText, const std::string &regexPattern, const std::string replaceString)
- static void **ReplaceAliases** (const std::string &in, std::string &out, std::vector< std::string > \*aliases=NULL)
- static void **ReplaceAliases** (const std::string &in, const std::string &replacedBy, std::string &out, std::vector< std::string > \*aliases=NULL)
- static std::string **ReplaceString** (const std::string &inText, const std::vector< std::string > &findString, const std::vector< std::string > &replaceWords)
- static std::string **ReplaceWord** (const std::string &inText, const std::vector< std::string > &findWords, const std::vector< std::string > &replaceWords)
- static std::string **ReplaceWord** (const std::string &inText, const std::string &findWords, const std::string &replaceWords)
- static int32\_t **RFindNoCase** (const std::string &src, const std::string &findWhat, uint32\_t pos=0)

- static int32\_t **RFindNoCase** (const char \*src, const char \*findWhat, uint32\_t pos=0)
- static double **Rnd** (double value, double precision)
- static double **Round** (double value)
- static void **SetInternalDataDir** (const std::string &DataDir)
- static double **Sign** (double X)
- static double **Sin** (double X)
- static double **Sinc** (double x)
- static double **SinD** (double X)
- static std::string **SlashesDecode** (const std::string &str, const std::string &exclude="", bool decodeliterals=true)
- static std::string **SlashesEncode** (const std::string &str, const std::string &exclude="", const std::string &literals="", bool hexadecimal=true)
- static int32\_t **snprintf** (char \*str, size\_t size, const char \*format,...) `__attribute__((format(printf`
- static double **Sqr** (double X)
- static double **Sqrt** (double X)
- static int32\_t **StrCaseCmp** (const char \*str1, const char \*str2)
- static bool **StringCompare** (const std::string &s1, const std::string &s2)
- static std::string **StringRemoveAllSpaces** (const std::string &str)
- static std::string **StringReplace** (const std::string &str, char c, char replaceBy)
- static std::string **StringReplace** (const std::string &str, const std::string &c, const std::string &replaceBy, bool compareNoCase=false)
- static void **StringToAlias** (const std::string &in, std::string &out, const char beginning)
- static std::string **StringToLower** (const std::string &str)
- static std::string **StringToUpper** (const std::string &str)
- static std::string **StringTrim** (const std::string &str)
- static double **StrToDouble** (const std::string &value)
- static float **StrToFloat** (const std::string &value)
- static int32\_t **StrToInt32** (const std::string &s)
- static int64\_t **StrToInt64** (const std::string &s)
- static int64\_t **StrToLong** (const std::string &s)
- static uint64\_t **StrToUInt64** (const std::string &s)
- static void **SwapValue** (int32\_t &value)
- static void **SwapValue** (int16\_t &value)
- static void **SwapValue** (float &value)
- static void **SwapValue** (double &value)
- static double **Tan** (double X)
- static double **TanD** (double X)
- static char \* **ToLower** (char \*str)
- static char **ToLower** (const char chr)
- static std::string **ToString** (const char \*s, size\_t len=std::string::npos)
- static char \* **ToUpper** (char \*str)
- static char **ToUpper** (const char chr)
- static std::string **TrailingZeroesTrim** (const std::string &Text, bool dotTrim=true)
- static char \* **Trim** (char \*str)
- static double **UnaryMinus** (double X)
- static double **UnaryNot** (double X)
- static double **UnconvertLat** (const std::string &value)
- static double **UnconvertLon** (const std::string &value, bool normalize=true)
- static int32\_t **VectorContiguousBlock** (uint32\_t ndims, const uint32\_t \*const shape, const uint32\_t \*const edges, uint32\_t \*const countContinuousBlock)
- static uint32\_t **VectorOffset** (uint32\_t \*shape, uint32\_t ndims, const uint32\_t \*coord)
- static bool **Xor** (bool p, bool q)

## Static Public Attributes

- static const double **m\_CompareEpsilon** = 1.0E-70
- static const char **m\_defaultValueCHAR** = '\0'  
*default values for chars*
- static const double **m\_defaultValueDOUBLE** = 18446744073709551616.0  
*default values for double*
- static const float **m\_defaultValueFLOAT** = 18446744073709551616.0F  
*default values for float*
- static const int16\_t **m\_defaultValueINT16** = 0x7FFF  
*default values for int 16 bits*
- static const int32\_t **m\_defaultValueINT32** = 0x7FFFFFFF  
*default values for int 32 bits*
- static const int64\_t **m\_defaultValueINT64** = 0x7FFFFFFFFFFFFFFFLL  
*default values for unsigned int 64 bits*
- static const int8\_t **m\_defaultValueINT8** = 0x7F  
*default values for int 8 bits*
- static const char \* **m\_defaultValueString** = ""  
*default values for std::string*
- static const uint16\_t **m\_defaultValueUINT16** = 0xFFFFU  
*default values for unsigned int 16 bits*
- static const uint32\_t **m\_defaultValueUINT32** = 0xFFFFFFFFU  
*default values for unsigned int 32 bits*
- static const uint64\_t **m\_defaultValueUINT64** = 0xFFFFFFFFFFFFFFFFULL  
*default values for unsigned int 64 bits*
- static const uint8\_t **m\_defaultValueUINT8** = 0xFFU  
*default values for unsigned int 8 bits*
- static const double **m\_deltaLatitudeMercator** = 1.0E-7

## 8.98.1 Detailed Description

Tools management class.

This class provides various static utility methods

## Version

1.0

## 8.98.2 Member Function Documentation

## 8.98.2.1 double brathl::CTools::Abs ( double X ) [static]

Find the absolute value of a number. Takes default values into account

## Parameters

in	X	: Number involved
----	---	-------------------

## Returns

Result of operation

### 8.98.2.2 std::string brathl::CTools::AbsolutePath ( const std::string & *partialPath* ) [static]

Creates an absolute or full path name for the specified relative path name.

- change path separator in a suitable path separator ('\' or '/' depending on the system)
- skip trailing "../", if any
- remove back references: translate dir1/./dir2 to dir2

## Parameters

in	<i>partialPath</i>	: the relative path
----	--------------------	---------------------

## Returns

the absolute path name, or empty std::string if there is an error (for example, if the value passed in relPath includes a drive letter that is not valid or cannot be found, or if the length of the created absolute path name is greater than the BRATHL\_PATH\_MAX defined in **brathl.h** (p. 336))

### 8.98.2.3 double brathl::CTools::ACos ( double *X* ) [static]

Do the arc cosine of a number expressed in radians. Takes default values into account

## Parameters

in	<i>X</i>	: Number involved
----	----------	-------------------

## Returns

Result of operation

Referenced by ACosD().

### 8.98.2.4 double brathl::CTools::ACosD ( double *X* ) [static]

Do the arc cosine of a number expressed in degrees. Takes default values into account

## Parameters

in	<i>X</i>	: Number involved
----	----------	-------------------

## Returns

Result of operation

References ACos().

### 8.98.2.5 double brathl::CTools::And ( double *X*, double *Y* ) [static]

Do a logical and on two numbers. Takes default values into account

## Parameters

in	<i>X</i>	: Number involved
in	<i>Y</i>	: Number involved



**Returns**

Result of operation

**8.98.2.6 double brathl::CTools::BitwiseAnd ( double *X*, double *Y* ) [static]**

Do a bitwise AND operation an integer. The numbers are taken as signed integers (int32\_t). Then a bitwise AND is computed and the integer is converted back to a float. If the parameters are default values or do not fall in integer range, a default value is returned.

**Parameters**

in	<i>X</i>	: Number involved
in	<i>Y</i>	: Number involved

**Returns**

Result of operation

**8.98.2.7 double brathl::CTools::BitwiseNot ( double *X* ) [static]**

Complement an integer. The number is taken as a signed integer (int32\_t). Then a bitwise not is computed and the integer is converted back to a float. If the parameter is a default values or do not fall in integer range, a default value is returned.

**Parameters**

in	<i>X</i>	: Number involved
----	----------	-------------------

**Returns**

Complemented number

**8.98.2.8 double brathl::CTools::BitwiseOr ( double *X*, double *Y* ) [static]**

Do a bitwise OR operation an integer. The numbers are taken as signed integers (int32\_t). Then a bitwise OR is computed and the integer is converted back to a float. If the parameters are default values or do not fall in integer range, a default value is returned.

**Parameters**

in	<i>X</i>	: Number involved
in	<i>Y</i>	: Number involved

**Returns**

Result of operation

**8.98.2.9 double brathl::CTools::Ceil ( double *X* ) [static]**

Find the integral value part over of a number. Takes default values into account

**Parameters**

in	<i>X</i>	: Number involved
----	----------	-------------------

**Returns**

Result of operation

**8.98.2.10 double brathl::CTools::Cos ( double *X* ) [static]**

Do the cosine of a number expressed in radians. Takes default values into account

**Parameters**

<i>in</i>	<i>X</i>	: Number involved
-----------	----------	-------------------

**Returns**

Result of operation

**8.98.2.11 double brathl::CTools::CosD ( double *X* ) [static]**

Do the cosine of a number expressed in degrees. Takes default values into account

**Parameters**

<i>in</i>	<i>X</i>	: Number involved
-----------	----------	-------------------

**Returns**

Result of operation

**8.98.2.12 double brathl::CTools::Deg2Rad ( double *X* ) [static]**

Convert degrees to radians. Takes default values into account

**Parameters**

<i>in</i>	<i>X</i>	: Number involved
-----------	----------	-------------------

**Returns**

Result of operation

Referenced by TanD().

**8.98.2.13 bool brathl::CTools::DirectoryExists ( const std::string & *Name* ) [static]**

Indicates if a directory exists

**Parameters**

<i>in</i>	<i>Name</i>	: Directory name
-----------	-------------	------------------

**Returns**

Returns true if directory exists

**8.98.2.14 double brathl::CTools::Divide ( double *X*, double *Y* ) [static]**

Divide two numbers. Takes default values into account

## Parameters

in	X	: Number involved
in	Y	: Number involved

## Returns

Result of operation

**8.98.2.15** void brathl::CTools::DoIncrementalStats ( double *NewValue*, double & *Count*, double & *Mean*, double & *StdDev*, double & *Min*, double & *Max* ) [static]

Do incremental statistics. Incremental statistics are done to avoid memory consumption needed when we do 'classical' stats: an array of all the values involved with statistics must be kept before computing them. After first call to this the parameters must not be modified until end of statistics or result will be unpredictable.

## Parameters

in	<i>NewValue</i>	: New value to take into account for statistics. Only valid values are kept; valid values are those different from default value (#IsDefaultValue#)
	<i>in/out</i>	Count : number of valid data used for stats. Valid data is a number which is not a default value. On first call, this parameter must be 0 or a default value. And it is not modified since the first valid value.
	<i>in/out</i>	Mean : Incremental mean
	<i>in/out</i>	StdDev : Temporary value used to compute standard deviation
	<i>in/out</i>	Min : Minimum value
	<i>in/out</i>	Max : Maximum value

**8.98.2.16** std::string brathl::CTools::DoubleToStr ( double *d*, int32\_t *precision* = 10 ) [static]

Convert an double to std::string

## Parameters

in	<i>value</i>	: double to be converted
----	--------------	--------------------------

## Returns

coanverted value or empty std::string if no possible conversion.

**8.98.2.17** double brathl::CTools::Exp ( double *X* ) [static]

Find exponential of a number. Takes default values into account

## Parameters

in	X	: Number involved
----	---	-------------------

## Returns

Result of operation

References IsInf().

**8.98.2.18** std::string brathl::CTools::ExpandShellVar ( const std::string & *value* ) [static]

Expands shell variables (i.e. \${HOME}). If the '\$' character is preceded by '\', it's taken into account as a common character and not as a shell variable identifier. Shell variables beginning by '+' are expanded in uppercase. Shell variables beginning by '-' are expanded in lowercase.

## Parameters

<i>in</i>	<i>value</i>	: The std::string to expand
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## Returns

the newly expanded std::string.

References ExpandVariables().

Referenced by bratl::CParameter::AddValue().

**8.98.2.19** `std::string bratl::CTools::ExpandVariables ( const std::string & valueIn, const std::map< std::string, std::string > * varValues, bool recurse = false, char beginning = ' % ', uint32_t * numberVarsExpanded = NULL, bool withExcept = false, std::string * errorMsg = NULL ) [static]`

Expand variables (i.e. %{VAR}). If the " character is preceded by '\', it's taken into account as a common character and not as a variable identifier. Variables beginning by '+' are expanded in uppercase. Variables beginning by '-' are expanded in lowercase.

## Parameters

<i>in</i>	<i>value</i>	: The std::string to expand
<i>in</i>	<i>VarValues</i>	: The values of the variables. If NULL, the environment variables are taken.
<i>in</i>	<i>Beginning</i>	: Char identifying the beginning of a var reference
<i>in</i>	<i>Recurse</i>	: If true, variable expanded can contain references to other variables which are then expanded.

## Returns

the newly expanded std::string.

Referenced by ExpandShellVar(), and bratl::CParameter::SetAliases().

**8.98.2.20** `bool bratl::CTools::FileExists ( const std::string & Name ) [static]`

Indicates if a file exists

## Parameters

<i>in</i>	<i>Name</i>	: File name
-----------	-------------	-------------

## Returns

Returns true if file exists and is readable

**8.98.2.21** `std::string bratl::CTools::FileExtension ( const std::string & fileName ) [static]`

Gets a file name extension.

## Parameters

<i>in</i>	<i>filename</i>	: file name
-----------	-----------------	-------------

## Returns

the extension, or empty std::string if none

**8.98.2.22** void brathl::CTools::FinalizeIncrementalStats ( double *Count*, double & *Mean*, double & *StdDev*, double & *Min*, double & *Max*, double *DefaultValue* = m\_defaultValueDOUBLE ) [static]

Terminates incremental statistics. Computes the final value of standard deviation

## Parameters

in	<i>Count</i>	: number of valid data used for stats. If count is 0 or default value, all other output parameters are set to default value.
	<i>in/out</i>	Mean : Computed mean or default value (see Count)
	<i>in/out</i>	StdDev : On output, actual value of standard deviation
	<i>in/out</i>	Min : Computed min or default value (see Count)
	<i>in/out</i>	Max : Computed max or default value (see Count)
in	<i>DefaultValue</i>	: Default value wanted Value to put in output parameters if no stats can be done (no valid data: count is 0 or default value <b>m_defaultValueDOUBLE</b> (p. 309)#).

**8.98.2.23** std::string brathl::CTools::FindDataFile ( const std::string & *Name* ) [static]

Finds a file path known only by its name. The path is retrieved from compilation (intallation prefix) or by environment variable.

## Parameters

in	<i>Name</i>	: File name
----	-------------	-------------

## Returns

Returns the path of found file or an empty std::string if not found

Referenced by brathl::CMission::LoadAliasName().

**8.98.2.24** std::string brathl::CTools::FindFileInPath ( const std::string & *filename*, const std::string & *path* ) [static]

Finds a file location known only by its name using the give path. The path should be similar to what can be used for the PATH environment variable on the current system.

## Parameters

in	<i>filename</i>	: File name
in	<i>path</i>	: Search path

## Returns

Returns the full path to the file or an empty std::string if not found

**8.98.2.25** double brathl::CTools::Floor ( double *X* ) [static]

Find the integral value part below of a number. Takes default values into account

## Parameters

in	<i>X</i>	: Number involved
----	----------	-------------------

## Returns

Result of operation

#### 8.98.2.26 std::string bratl::CTools::Format ( size\_t size, const char \* format, ... ) [static]

Write formatted data to a std::string. WARNING : this method use vsnprintf if vsnprintf is defined, otherwise vsprintf is used and 'size' parameter is ignored

## Parameters

in	size	: maximum number of characters to store
in	format	: format-control std::string
in	...	: optional arguments

## Returns

formatted std::string

Referenced by bratl::CDate::AsString(), bratl::BuildExistingInternalFileKind(), bratl::CFileParams::CheckCount(), bratl::CDate::CvDate(), bratl::CDoubleMap::Dump(), bratl::CObDoubleMap::Dump(), bratl::CDoublePtrDoubleMap::Dump(), bratl::CDataSet::EraseFieldSet(), bratl::CBratAlgorithmGeosVelGrid::GetInputParamDesc(), bratl::CBratAlgorithmGeosVelAtp::GetInputParamDesc(), bratl::CBratAlgoFilterMedian1D::GetInputParamDesc(), bratl::CBratAlgoFilterLoess1D::GetInputParamDesc(), bratl::CBratAlgoFilterLoess2D::GetInputParamDesc(), bratl::CBratAlgoFilterMedian2D::GetInputParamDesc(), bratl::CBratAlgorithmGeosVelGrid::GetInputParamFormat(), bratl::CBratAlgorithmGeosVelAtp::GetInputParamFormat(), bratl::CBratAlgoFilterMedian1D::GetInputParamFormat(), bratl::CBratAlgoFilterLoess2D::GetInputParamFormat(), bratl::CBratAlgoFilterLoess1D::GetInputParamFormat(), bratl::CBratAlgoFilterMedian2D::GetInputParamFormat(), bratl::CBratAlgorithmGeosVelGrid::GetInputParamUnit(), bratl::CBratAlgorithmGeosVelAtp::GetInputParamUnit(), bratl::CBratAlgoFilterMedian1D::GetInputParamUnit(), bratl::CBratAlgoFilterMedian2D::GetInputParamUnit(), bratl::CBratAlgoFilterLoess2D::GetInputParamUnit(), bratl::CBratAlgoFilterLoess1D::GetInputParamUnit(), bratl::CParameter::GetValue(), bratl::CUIntMap::Insert(), bratl::CDataSet::InsertFieldSet(), bratl::CProductErsWAP::IsHighResolutionField(), bratl::CFile::Open(), bratl::CFile::ReadToBuffer(), bratl::CBratAlgoFilterLanczos1D::Run(), bratl::CBratAlgoFilterGaussian1D::Run(), bratl::CBratAlgoFilterMedian1D::Run(), bratl::CBratAlgoFilterLoess1D::Run(), bratl::CDatePeriod::SetFrom(), bratl::CDatePeriod::SetTo(), SlashesDecode(), SlashesEncode(), bratl::CFile::WriteChar(), bratl::CFile::WriteFromBuffer(), and bratl::CFile::WriteString().

#### 8.98.2.27 std::string bratl::CTools::Format ( const char \* format, ... ) [static]

Write formatted data to a std::string. WARNING : this method use vsnprintf if vsnprintf is defined, otherwise vsprintf is used and 'size' parameter is ignored

## Parameters

in	format	: format-control std::string
in	...	: optional arguments

## Returns

formatted std::string

#### 8.98.2.28 std::string bratl::CTools::Format ( size\_t size, const char \* format, va\_list args ) [static]

Write formatted data to a std::string. WARNING : this method use vsnprintf if vsnprintf is defined, otherwise vsprintf is used and 'size' parameter is ignored

## Parameters

in	<i>size</i>	: maximum number of characters to store
in	<i>format</i>	: format-control std::string
in	<i>args</i>	: optional arguments

## Returns

formatted std::string

#### 8.98.2.29 std::string brathl::CTools::GetInternalDataDir ( ) [static]

Returns the constant data directory defined at compilation time, by environment variable, or set by application.

## Returns

Returns the path of found file or an empty std::string if not found

Referenced by brathl::CMission::LoadAliasName().

#### 8.98.2.30 std::string brathl::CTools::IntToStr ( int32\_t i ) [static]

Convert an int to std::string

## Parameters

in	<i>value</i>	: int to be converted
----	--------------	-----------------------

## Returns

coconverted value or empty std::string if no possible conversion.

#### 8.98.2.31 double brathl::CTools::IsBounded ( double Min, double X, double Max ) [static]

Indicates if a number is comprised between two others. Takes default values into account

## Parameters

in	<i>Min</i>	: Lower bound
in	<i>X</i>	: Number involved
in	<i>Max</i>	: Upper bound

## Returns

Result of operation: 0 if not  $Min \leq X \leq Max$ .

#### 8.98.2.32 double brathl::CTools::IsBoundedStrict ( double Min, double X, double Max ) [static]

Indicates if a number is comprised between two others. Takes default values into account

## Parameters

in	<i>Min</i>	: Lower bound
in	<i>X</i>	: Number involved
in	<i>Max</i>	: Upper bound

**Returns**

Result of operation: 0 if not  $\text{Min} < X < \text{Max}$ .

**8.98.2.33 double brathl::CTools::IsDefaultFloat ( double *X* ) [static]**

Checks a default value.

**Parameters**

in	<i>X</i>	: Number involved
----	----------	-------------------

**Returns**

0.0 if *X* is not a default value, 1.0 otherwise

**8.98.2.34 int32\_t brathl::CTools::IsInf ( double *X* ) [static]**

Indicates if a number is infinite.

**Parameters**

in	<i>X</i>	: Number involved
----	----------	-------------------

**Returns**

0 if *X* in finite 1 if infinite

Referenced by Exp(), Pow(), Sqr(), and Tan().

**8.98.2.35 int32\_t brathl::CTools::IsNan ( double *X* ) [static]**

Indicates if a value is a valid number.

**Parameters**

in	<i>X</i>	: Number involved
----	----------	-------------------

**Returns**

0 if *X* is valid, 1 if *X* is not a number

Referenced by Tan().

**8.98.2.36 double brathl::CTools::Log ( double *X* ) [static]**

Find the natural logarithm of a number. Takes default values into account

**Parameters**

in	<i>X</i>	: Number involved
----	----------	-------------------

**Returns**

Result of operation

**8.98.2.37 double brathl::CTools::Log10 ( double *X* ) [static]**

Find the decimal logarithm of a number. Takes default values into account



## Parameters

in	X	: Number involved
----	---	-------------------

## Returns

Result of operation

**8.98.2.38** `std::string bratl::CTools::MakeCorrectPath ( const std::string & path ) [static]`

Cleans a path variable

- change path separator in a suitable path separator ('\' or '/' depending on the system)
- skip trailing "../", if any
- remove back references: translate dir1/../dir2 to dir2

## Parameters

in	path	: The std::string to clean
----	------	----------------------------

## Returns

the newly cleaned std::string.

**8.98.2.39** `double bratl::CTools::Max ( double X1, double X2 ) [static]`

Find the maximum value of two numbers. Takes default values into account

## Parameters

in	X1	: Number involved
in	X2	: Number involved

## Returns

Result of operation

Referenced by `bratl::CCriteriaLatLon::GetMinOrMaxLon()`.

**8.98.2.40** `double bratl::CTools::Min ( double X1, double X2 ) [static]`

Find the minimum value of two numbers. Takes default values into account

## Parameters

in	X1	: Number involved
in	X2	: Number involved

## Returns

Result of operation

Referenced by `bratl::CCriteriaLatLon::GetMinOrMaxLon()`.

**8.98.2.41** `double bratl::CTools::Minus ( double X, double Y ) [static]`

Subtracts one number from another. TAKES default values into account

## Parameters

in	X	: Number involved
in	Y	: Number involved

## Returns

Result of operation

## 8.98.2.42 double brathl::CTools::Mod ( double X, double Y ) [static]

Find the modulus of a number divided by another. Takes default values into account

## Parameters

in	X	: Number involved
in	Y	: Divider

## Returns

Result of operation

## 8.98.2.43 double brathl::CTools::Multiply ( double X, double Y ) [static]

Multiply two numbers. Takes default values into account

## Parameters

in	X	: Number involved
in	Y	: Number involved

## Returns

Result of operation

## 8.98.2.44 double brathl::CTools::NormalizeLongitude ( double Floor, double Longitude ) [static]

Find a number satisfying the condition  $\text{Floor} \leq \text{Longitude} < \text{Floor} + 360$ . Takes default values into account

## Parameters

in	Floor	: Base longitude
in	Longitude	: Longitude to normalize

## Returns

Result of operation

## 8.98.2.45 double brathl::CTools::Or ( double X, double Y ) [static]

Do a logical or on two numbers. Takes default values into account

## Parameters

in	X	: Number involved
in	Y	: Number involved

**Returns**

Result of operation

**8.98.2.46** `double bratl::CTools::Plus ( double X, double Y ) [static]`

Add two numbers. Takes default values into account

**Parameters**

<code>in</code>	<code>X</code>	: Number involved
<code>in</code>	<code>Y</code>	: Number involved

**Returns**

Result of operation

**8.98.2.47** `double bratl::CTools::Pow ( double X, double Y ) [static]`

Find the power of a number by another. Takes default values into account

**Parameters**

<code>in</code>	<code>X</code>	: Number involved
<code>in</code>	<code>Y</code>	: Power. Can be a integral or decimal

**Returns**

Result of operation

References `IsInf()`.

**8.98.2.48** `double bratl::CTools::Rad2Deg ( double X ) [static]`

Convert radians to degrees. Takes default values into account

**Parameters**

<code>in</code>	<code>X</code>	: Number involved
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**Returns**

Result of operation

**8.98.2.49** `char * bratl::CTools::RemoveAllSpaces ( char * str ) [static]`

Remove all the blank characters in a `std::string`. Blank characters are identified by the function `isspace (3C)`.

**Parameters**

<code>str</code>	[in/out] : <code>std::string</code> to be modified
------------------	--

**Returns**

a pointer to the `std::string`

Referenced by `StringRemoveAllSpaces()`.

**8.98.2.50** `std::string brathl::CTools::RemoveCharSurroundingNumber ( const std::string & str, const char c1 = ' ( ' , const char c2 = ' ) ' ) [static]`

Removes characters *c1* and *c2*, if these characters surround an number (integer or decimal). For example: RemoveCharSurroundingNumber("ABCD (125)", '(', ')') will return "ABCD 125" RemoveCharSurroundingNumber("ABCD (+125.63)", '(', ')') will return "ABCD +125.63" RemoveCharSurroundingNumber("ABCD (-45) (XYZ\*2)", '(', ')') will return "ABCD -45 (XYZ\*2)" RemoveCharSurroundingNumber("(ABCD ((-45)))", '(', ')') will return "(ABCD (-45))"

#### Parameters

in	<i>str</i>	: The std::string to modify
in	<i>c1</i>	: the first surrounding char
in	<i>c2</i>	: the last surrounding char

#### Returns

the newly modified std::string.

**8.98.2.51** `void brathl::CTools::SetInternalDataDir ( const std::string & DataDir ) [static]`

Explicitly set the Data Directory.

#### Parameters

in	<i>DataDir</i>	: Full path to data directory.
----	----------------	--------------------------------

**8.98.2.52** `double brathl::CTools::Sign ( double X ) [static]`

Find the sign of a number (1 if positive or null, -1 if negative). Takes default values into account

#### Parameters

in	<i>X</i>	: Number involved
----	----------	-------------------

#### Returns

Result of operation

**8.98.2.53** `double brathl::CTools::Sin ( double X ) [static]`

Do the sine of a number expressed in radians. Takes default values into account

#### Parameters

in	<i>X</i>	: Number involved
----	----------	-------------------

#### Returns

Result of operation

**8.98.2.54** `double brathl::CTools::SinD ( double X ) [static]`

Do the sine of a number expressed in degrees. Takes default values into account

#### Parameters

in	<i>X</i>	: Number involved
----	----------	-------------------

## Returns

Result of operation

**8.98.2.55** `std::string brathl::CTools::SlashesDecode ( const std::string & str, const std::string & exclude = "", bool decodeliterals = true ) [static]`

Takes a `std::string` with escaped charters including decimal and hexadecimal escapes and decodes them to the literal charter. This function supports only standard C/C++ escaped literals.

## Parameters

in	<i>str</i>	: The <code>std::string</code> to decode.
in	<i>exclude</i>	: A list of charters to exclude from decoding.
in	<i>decodeliterals</i>	: Set if non standard escaped literals are to be decoded.

## Returns

the newly encoded `std::string`.

References `Format()`.

**8.98.2.56** `std::string brathl::CTools::SlashesEncode ( const std::string & str, const std::string & exclude = "", const std::string & literals = "", bool hexadecimal = true ) [static]`

This encodes characters that are not printable or can be encode with one of the C/C++ standard escape sequences. The 'exclude' list is a list of chars to exclude from the encoding process. Since the '\0' is used to determine the end of the `std::string` and will not be encoded.

## Parameters

in	<i>str</i>	: The <code>std::string</code> to encode.
in	<i>exclude</i>	: A list of charters to exclude from encoding.
in	<i>literals</i>	:A list of printable characters to be included in the encodeing.
	<i>hexadecimal</i>	If true, non-standard, non-printable charecters will be encoded in hexadecimal. If false they will be encoded in octal format.

## Returns

the newly encoded `std::string`.

References `Format()`.

**8.98.2.57** `int32_t brathl::CTools::snprintf ( char * str, size_t size, const char * format, ... ) [static]`

Write formatted data to a `std::string`. WARNING : this method use `vsprintf` if `vsprintf` is defined, otherwise `vsprintf` is used and 'size' parameter is ignored

## Parameters

out	<i>str</i>	: storage location for output.
in	<i>size</i>	: maximum number of characters to store
in	<i>format</i>	: format-control <code>std::string</code>
in	<i>...</i>	: optional arguments

## Returns

return value of the `vsprintf` or `vsprintf` - see documentation of these functions

**8.98.2.58 double brathl::CTools::Sqr ( double *X* ) [static]**

Find the square value of a number. Takes default values into account

**Parameters**

<i>in</i>	<i>X</i>	: Number involved
-----------	----------	-------------------

**Returns**

Result of operation

References IsInf().

**8.98.2.59 double brathl::CTools::Sqrt ( double *X* ) [static]**

Find the square root value of a number. Takes default values into account

**Parameters**

<i>in</i>	<i>X</i>	: Number involved
-----------	----------	-------------------

**Returns**

Result of operation

**8.98.2.60 int32\_t brathl::CTools::StrCaseCmp ( const char \* *str1*, const char \* *str2* ) [static]**

Compare the two strings *str1* and *str2*, while being unaware of the differences between upper-case and lower-case. This method is thus identical to the function `strcasecmp` (3C) with the following difference : *str1*, *str2* can be NULL, in this case, the `std::string` concerned is regarded as a null `std::string`.

**Parameters**

<i>in</i>	<i>str1</i>	: <code>std::string</code> 1
<i>in</i>	<i>str2</i>	: <code>std::string</code> 2

**Returns**

: negative, null (= 0) or positive value if the *str1* is respectively lower, equal or higher than *str2*.

Referenced by `brathl::CParameter::GetValue()`.

**8.98.2.61 std::string brathl::CTools::StringRemoveAllSpaces ( const std::string & *str* ) [static]**

Remove all the blank characters in a `std::string`. Blank characters are identified by the function `isspace` (3C).

**Parameters**

<i>in</i>	<i>str</i>	: <code>std::string</code> to be modified
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**Returns**

the modified std::string

References RemoveAllSpaces().

**8.98.2.62** std::string bratl::CTools::StringReplace ( const std::string & *str*, char *c*, char *replaceBy* ) [static]

Replace all tokens of char *c* by char *replaceBy* in a std::string.

**Parameters**

in	<i>str</i>	: std::string to be modified
in	<i>c</i>	: char to replace
in	<i>replaceBy</i>	: char replaced

**Returns**

the modified std::string

**8.98.2.63** std::string bratl::CTools::StringReplace ( const std::string & *str*, const std::string & *c*, const std::string & *replaceBy*, bool *compareNoCase* = false ) [static]

Replace all tokens of std::string *c* by std::string *replaceBy* in a std::string.

**Parameters**

in	<i>str</i>	: std::string to be modified
in	<i>c</i>	: std::string to replace
in	<i>replaceBy</i>	: std::string replaced

**Returns**

the modified std::string

**8.98.2.64** std::string bratl::CTools::StringToLower ( const std::string & *str* ) [static]

Set a std::string object in lowercase

**Parameters**

<i>str</i>	[in/out] : std::string to be modified
------------	---------------------------------------

**Returns**

a new std::string object in lowercase

References ToLower().

Referenced by bratl::CProductEnvisat::IsHighResolutionField().

**8.98.2.65** std::string bratl::CTools::StringToUpper ( const std::string & *str* ) [static]

Set a std::string object in uppercase

**Parameters**

in	<i>str</i>	: character
----	------------	-------------

**Returns**

a new std::string object in uppercase

References ToUpper().

**8.98.2.66** `std::string brathl::CTools::StringTrim ( const std::string & str ) [static]`

Remove all the blank characters at the beginning and the end of a std::string. Blank characters are identified by the function isspace (3C).

**Parameters**

<i>str</i>	[in/out] : std::string to be modified
------------	---------------------------------------

**Returns**

a trimmed std::string

Referenced by brathl::CMission::LoadAliasName(), StrToDouble(), Trim(), UnconvertLat(), and UnconvertLon().

**8.98.2.67** `double brathl::CTools::StrToDouble ( const std::string & value ) [static]`

Convert an std::string to double

**Parameters**

<i>in</i>	<i>value</i>	: std::string to be converted
-----------	--------------	-------------------------------

**Returns**

coconverted value or CTool::m\_defaultValueDOUBLE if no possible conversion.

References StringTrim().

Referenced by UnconvertLat(), and UnconvertLon().

**8.98.2.68** `int32_t brathl::CTools::StrToInt32 ( const std::string & s ) [static]`

Convert an std::string to int

**Parameters**

<i>in</i>	<i>value</i>	: std::string to be converted
-----------	--------------	-------------------------------

**Returns**

coconverted value or CTool::m\_defaultValueINT if no possible conversion.

Referenced by brathl::CCriteriaCycle::Set(), brathl::CCriteriaPassInt::Set(), brathl::CCriteriaCycle::SetFrom(), brathl::CCriteriaPassInt::SetFrom(), brathl::CCriteriaCycle::SetTo(), and brathl::CCriteriaPassInt::SetTo().

**8.98.2.69** `int64_t brathl::CTools::StrToInt64 ( const std::string & s ) [static]`

Convert an std::string to int64

**Parameters**

<i>in</i>	<i>value</i>	: std::string to be converted
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**Returns**

coanverted value or CTool::m\_defaultValueINT if no possible conversion.

**8.98.2.70 uint64\_t brathl::CTools::StrToUInt64 ( const std::string & s ) [static]**

Convert an std::string to uint64

**Parameters**

<i>in</i>	<i>value</i> : std::string to be converted
-----------	--

**Returns**

coanverted value or CTool::m\_defaultValueINT if no possible conversion.

**8.98.2.71 double brathl::CTools::Tan ( double X ) [static]**

Do the tangent of a number expressed in radians. Takes default values into account

**Parameters**

<i>in</i>	<i>X</i> : Number involved
-----------	----------------------------

**Returns**

Result of operation

References IsInf(), and IsNan().

Referenced by TanD().

**8.98.2.72 double brathl::CTools::TanD ( double X ) [static]**

Do the tangent of a number expressed in degrees. Takes default values into account

**Parameters**

<i>in</i>	<i>X</i> : Number involved
-----------	----------------------------

**Returns**

Result of operation

References Deg2Rad(), and Tan().

**8.98.2.73 char \* brathl::CTools::ToLower ( char \* str ) [static]**

Set a std::string in lowercase

**Parameters**

<i>str</i>	[in/out] : std::string to be modified
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**Returns**

a pointer to the std::string

Referenced by StringToLower().

**8.98.2.74** `char brathl::CTools::ToLower ( const char chr ) [static]`

Set a std::string in lowercase

**Parameters**

<i>in</i>	<i>chr</i>	: character
-----------	------------	-------------

**Returns**

the lowercase character

**8.98.2.75** `char * brathl::CTools::ToUpper ( char * str ) [static]`

Set a std::string in uppercase

**Parameters**

<i>str</i>	[in/out] : std::string to be modified
------------	---------------------------------------

**Returns**

a pointer to the std::string

Referenced by StringToUpper().

**8.98.2.76** `char brathl::CTools::ToUpper ( const char chr ) [static]`

Set a character in uppercase

**Parameters**

<i>in</i>	<i>chr</i>	: character
-----------	------------	-------------

**Returns**

the uppercase character

**8.98.2.77** `std::string brathl::CTools::TrailingZeroesTrim ( const std::string & Text, bool dotTrim = true ) [static]`

Removes trailing zeroes from a number: 2.30000 is transformed into 2.3.

**Parameters**

<i>in</i>	<i>Text</i>	: String
<i>in</i>	<i>dotTrim</i>	: if true, remove dot at the end : 2.000 -> 2, if false, leave dot : 2.000 -> 2.

**Returns**

Returns modified std::string

**8.98.2.78** `char * brathl::CTools::Trim ( char * str ) [static]`

Remove all the blank characters at the beginning and the end of a std::string. Blank characters are identified by the function isspace (3C).

## Parameters

<i>str</i>	[in/out] : std::string to be modified
------------	---------------------------------------

## Returns

a pointer to the std::string

References StringTrim().

Referenced by brathl::CFile::ReadLineData().

#### 8.98.2.79 double brathl::CTools::UnaryMinus ( double *X* ) [static]

Negates a number. Takes default values into account

## Parameters

<i>in</i>	<i>X</i> : Number involved
-----------	----------------------------

## Returns

Negated number

#### 8.98.2.80 double brathl::CTools::UnaryNot ( double *X* ) [static]

Negates a logical value (0 is false, other (except default value) is true. Takes default values into account

## Parameters

<i>in</i>	<i>X</i> : Number involved
-----------	----------------------------

## Returns

Negated value

#### 8.98.2.81 double brathl::CTools::UnconvertLat ( const std::string & *value* ) [static]

Converts and normalize a latitude std::string representation (eg 60 N, 75.56 W, 60, -75.56) Normalize +/-90.

## Parameters

<i>value</i>	latitude std::string representation
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References StringTrim(), and StrToDouble().

#### 8.98.2.82 double brathl::CTools::UnconvertLon ( const std::string & *value*, bool *normalize* =true ) [static]

Converts and eventually normalize a longitude std::string representation (eg 60 E, 120.23 W, 60, -120.23) Normalize +/-180.

## Parameters

<i>normalize</i>	set to true to normalize longitude value
<i>value</i>	longitude std::string representation

**Returns**

converted longitude.

References StringTrim(), and StrToDouble().

The documentation for this class was generated from the following files:

- Tools.h
- Tools.cpp

**8.99 brathl::CTreeField Class Reference**

```
#include <TreeField.h>
```

Inherits brathl::CObjectTree.

**Public Member Functions**

- virtual CObjectTreeIterator **AddChild** (CObjectTreeNode \*parent, const std::string &nm, **CField** \*x, bool goCurrent=false)
- virtual CObjectTreeIterator **AddChild** (CObjectTreeIterator &parent, const std::string &nm, **CField** \*x, bool goCurrent=false)
- virtual CObjectTreeIterator **AddChild** (const std::string &nm, **CField** \*x, bool goCurrent=false)
- **CTreeField** ()  
*Empty CTreeField (p. 330) ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr)  
*Dump function.*
- void **DumpDictionary** (std::ostream &fOut=std::cout)
- void **DumpDictionary** (const std::string &outputFileName)
- **CField** \* **FindParent** (**CField** \*field)
- **CField** \* **GetCurrentData** (bool withExcept=true)
- **CField** \* **GetParentData** (bool withExcept=true)
- **CField** \* **GetRootData** ()
- void **ResetHiddenFlag** ()
- virtual ~**CTreeField** ()  
*Destructor.*

**Static Public Member Functions**

- static **CField** \* **GetDataAsFieldObject** (CObjectTreeNode \*node, bool withExcept=true)
- static **CFieldRecord** \* **GetDataAsFieldRecordObject** (CObjectTreeNode \*node, bool withExcept=true)

**Static Public Attributes**

- static const std::string **m\_keyDelimiter** = "."

**Additional Inherited Members****8.99.1 Detailed Description**

Tree fields management class.

## Version

1.0

The documentation for this class was generated from the following files:

- TreeField.h
- TreeField.cpp

## 8.100 brathl::CUIntMap Class Reference

```
#include <List.h>
```

## Public Member Functions

- **CUIntMap** ()  
*CUIntMap* (p. 331) *ctor.*
- virtual void **Dump** (std::ostream &fOut=std::cerr) const  
*Dump fonction.*
- virtual bool **Erase** (CUIntMap::iterator it)
- virtual bool **Erase** (const std::string &key)
- virtual uint32\_t **Exists** (const std::string &key) const
- virtual void **GetKeys** (CStringArray &keys, bool bRemoveAll=true)
- virtual uint32\_t **Insert** (const std::string &key, uint32\_t value, bool withExcept=true)
- virtual void **Insert** (const **CUIntMap** &m, bool bRemoveAll=true, bool withExcept=true)
- virtual void **Insert** (const CStringArray &keys, uint32\_t initValue, bool bRemoveAll=true, bool withExcept=true)
- virtual void **Insert** (const CStringArray &keys, const CUIntArray &values, bool bRemoveAll=true, bool withExcept=true)
- virtual void **Insert** (const CStringArray &keys, bool bRemoveAll=true, bool withExcept=true)
- virtual uint32\_t **operator[]** (const std::string &key)
- virtual void **RemoveAll** ()
- virtual ~**CUIntMap** ()  
*CUIntMap* (p. 331) *dtor.*

## 8.100.1 Detailed Description

a set of unsigned integer value management classes.

## Version

1.0

The documentation for this class was generated from the following files:

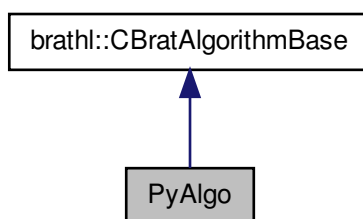
- List.h
- List.cpp

## 8.101 PyAlgo Class Reference

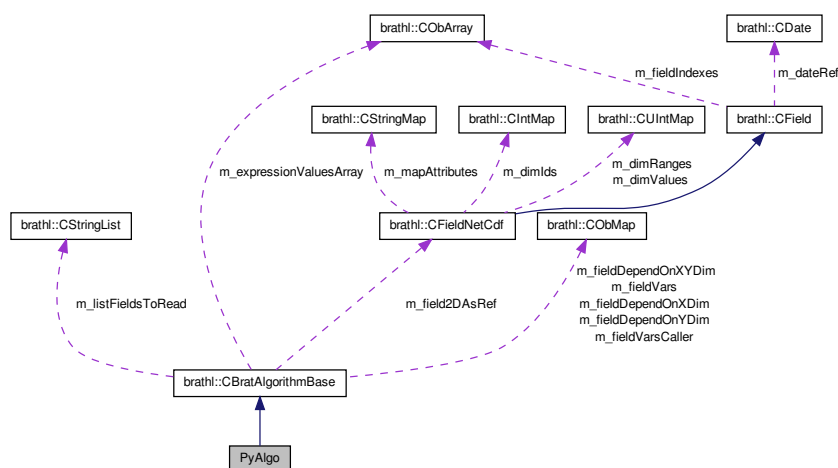
Definition of the object to hold each Python Algorithm and respective variables/methods.

```
#include <PythonEngine.hpp>
```

Inheritance diagram for PyAlgo:



Collaboration diagram for PyAlgo:



## Public Member Functions

- void **CreateAlgorithmParamVector** (CVectorBratAlgorithmParam &brat\_args, char \*\*args, size\_t argcount)
- virtual std::string **GetDescription** () const override
- virtual std::string **GetInputParamDesc** (uint32\_t indexParam) const override
- virtual  
CBratAlgorithmParam::bratAlgoParamTypeVal **GetInputParamFormat** (uint32\_t indexParam) const override
- virtual std::string **GetInputParamUnit** (uint32\_t indexParam) const override
- virtual std::string **GetName** () const override
- virtual uint32\_t **GetNumInputParam** () const override
- virtual std::string **GetOutputUnit** () const override
- virtual std::string **GetParamName** (uint32\_t indexParam) const override
- **PyAlgo** (const std::string file\_path, const std::string &class\_name)  
User defined constructor for **PyAlgo** (p. 331).
- virtual double **Run** (CVectorBratAlgorithmParam &args) override
- virtual ~**PyAlgo** ()  
Default destructor for **PyAlgo** (p. 331).

## Static Protected Member Functions

- static PyObject \* **createPyArguments** (CVectorBratAlgorithmParam &args)  
*Method to create a list of Python arguments.*
- template<typename T >  
static T & **processCall** (PyObject \*py\_result, T &result)  
*Method to process the result of a method call.*

## Additional Inherited Members

## 8.101.1 Detailed Description

Definition of the object to hold each Python Algorithm and respective variables/methods.

## 8.101.2 Constructor &amp; Destructor Documentation

8.101.2.1 PyAlgo::PyAlgo ( const std::string *file\_path*, const std::string & *class\_name* ) [inline]

User defined constructor for **PyAlgo** (p. 331).

## Parameters

in	<i>file_path</i>	The path of the algorithm python script/module.
in	<i>class_name</i>	Name of the algorithm class.

## 8.101.3 Member Function Documentation

8.101.3.1 static PyObject\* PyAlgo::createPyArguments ( CVectorBratAlgorithmParam & *args* ) [inline],[static],[protected]

Method to create a list of Python arguments.

## Returns

pArgs Python List with python objects/arguments.

Referenced by Run().

## 8.101.3.2 virtual std::string PyAlgo::GetDescription ( ) const [inline],[override],[virtual]

Gets the description of the algorithm

Implements **brathl::CBratAlgorithmBase** (p. 124).

References processCall().

8.101.3.3 virtual std::string PyAlgo::GetInputParamDesc ( uint32\_t *indexParam* ) const [inline],[override],[virtual]

Gets the description of an input parameter.

## Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **brathl::CBratAlgorithmBase** (p. 124).

References processCall().

**8.101.3.4** `virtual CBratAlgorithmParam::bratAlgoParamTypeVal PyAlgo::GetInputParamFormat ( uint32_t indexParam ) const` `[inline], [override], [virtual]`

Gets the format of an input parameter : CBratAlgorithmParam::T\_DOUBLE for double CBratAlgorithmParam::T\_FLOAT for float CBratAlgorithmParam::T\_INT for integer CBratAlgorithmParam::T\_LONG for long integer CBratAlgorithmParam::T\_STRING for std::string CBratAlgorithmParam::T\_CHAR for a character

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **bratl::CBratAlgorithmBase** (p. 124).

References processCall().

**8.101.3.5** `virtual std::string PyAlgo::GetInputParamUnit ( uint32_t indexParam ) const` `[inline], [override], [virtual]`

Gets the unit of an input parameter :

#### Parameters

<i>indexParam</i>	[in] : parameter index. First parameter index is 0, last one is 'number of parameters - 1'.
-------------------	---

Implements **bratl::CBratAlgorithmBase** (p. 124).

References processCall().

**8.101.3.6** `virtual std::string PyAlgo::GetName ( ) const` `[inline], [override], [virtual]`

Gets the name of the algorithm

Implements **bratl::CBratAlgorithmBase** (p. 124).

References processCall().

**8.101.3.7** `virtual uint32_t PyAlgo::GetNumInputParam ( ) const` `[inline], [override], [virtual]`

Gets the number of input parameters to pass to the 'Run' function

Implements **bratl::CBratAlgorithmBase** (p. 125).

References processCall().

**8.101.3.8** `virtual std::string PyAlgo::GetOutputUnit ( ) const` `[inline], [override], [virtual]`

Gets the unit of an output value returned by the 'Run' function.

Implements **bratl::CBratAlgorithmBase** (p. 125).

References processCall().

**8.101.3.9** `template<typename T> static T& PyAlgo::processCall ( PyObject * py_result, T & result )` `[inline], [static], [protected]`

Method to process the result of a method call.

#### Returns

result Result after conversion to proper data type.

Referenced by GetDescription(), GetInputParamDesc(), GetInputParamFormat(), GetInputParamUnit(), GetName(), GetNumInputParam(), GetOutputUnit(), and Run().



8.101.3.10 `virtual double PyAlgo::Run ( CVectorBratAlgorithmParam & args ) [inline],[override],  
[virtual]`

Runs the algorithm

#### Parameters

<i>fmt</i>	[in] : a std::string that indicates the format of each value of input parameters (number, std::string) : d for integer l for long integer f for double s for std::string
<i>args</i>	[in] : the values of input parameters i(a C/C++ va_list).

#### Returns

the result of the execution

Implements **brathl::CBratAlgorithmBase** (p. 125).

References `createPyArguments()`, and `processCall()`.

The documentation for this class was generated from the following file:

- `PythonEngine.hpp`

## 8.102 PythonEngine Class Reference

Definition of the object to hold the Python Interpreter and respective methods.

```
#include <PythonEngine.hpp>
```

#### Public Member Functions

- `bool evaluate (const std::string &expression) const`
- `PyObject * getObject (const std::string &name) const`

#### Static Public Member Functions

- `static PyObject * convert (PyObject *py_result, std::string &result)`
- `static PyObject * convert (PyObject *py_result, uint32_t &result)`
- `static PyObject * convert (PyObject *py_result, double &result)`
- `static PythonEngine * CreateInstance (wchar_t *pypath)`
- `static PythonEngine * Instance ()`

#### Protected Member Functions

- `PythonEngine (wchar_t *pypath)`

#### Protected Attributes

- `PyObject * m_global_dict = nullptr`

### 8.102.1 Detailed Description

Definition of the object to hold the Python Interpreter and respective methods.

The documentation for this class was generated from the following file:

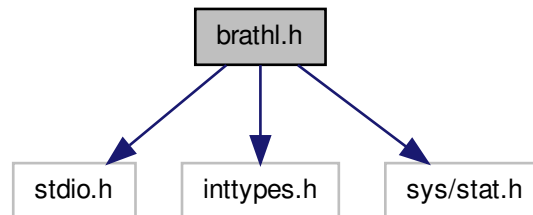
- `PythonEngine.hpp`

## 9 File Documentation

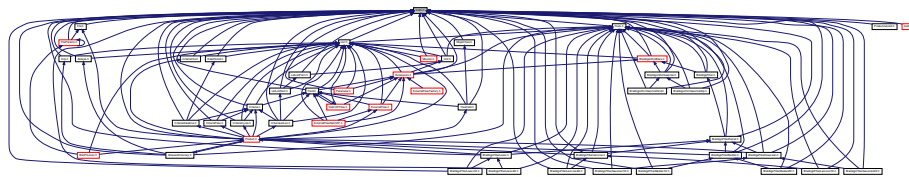
### 9.1 brathl.h File Reference

```
#include <stdio.h>
#include <inttypes.h>
#include <sys/stat.h>
```

Include dependency graph for brathl.h:



This graph shows which files directly or indirectly include this file:



#### Classes

- struct **\_structDateDSM**
- struct **\_structDateJulian**
- struct **\_structDateSecond**
- struct **\_structDateYMDHMSM**

#### Macros

- #define **BRATHL\_CYCLE\_LEN** 60
- #define **BRATHL\_MAX\_ERRMSG\_LEN** 255
- #define **BRATHL\_PATH\_MAX** PATH\_MAX
- #define **BRATHL\_REF\_DATE\_USER\_LEN** 28
- #define **BRATHL\_UNITFILE** "brathl\_units.dat"
- #define **HAVE\_INTTYPES\_H** 1
- #define **HAVE\_ISINF** 1
- #define **HAVE\_ISNAN** 1
- #define **HAVE\_REALPATH** 1
- #define **HAVE\_STAT** 1
- #define **HAVE\_STDINT\_H** 1
- #define **HAVE\_STRCASECMP** 1

- `#define HAVE_SYS_STAT_H 1`
- `#define HAVE_SYS_TYPES_H 1`
- `#define HAVE_UNISTD_H 1`
- `#define HAVE_VSNPRINTF 1`
- `#define LIBRATHL_API`
- `#define M_PI 3.14159265358979323846`
- `#define M_PI_2 1.57079632679489661923 /* pi/2 */`
- `#define M_PI_4 0.78539816339744830962 /* pi/4 */`
- `#define PATH_LIST_SEPARATOR ":"`
- `#define PATH_LIST_SEPARATOR_CHAR ':'`
- `#define PATH_SEPARATOR "/"`
- `#define PATH_SEPARATOR_CHAR '/'`

#### Typedefs

- `typedef struct _structDateDSM brathl_DateDSM`
- `typedef struct _structDateJulian brathl_DateJulian`
- `typedef struct _structDateSecond brathl_DateSecond`
- `typedef struct _structDateYMDHMSM brathl_DateYMDHMSM`
- `typedef int brathl_mission`

#### Enumerations

- `enum brathl_FileMode { ReadOnly, Write, Replace, New }`
- `enum brathl_global_constants {  
EARTH_ROTATION = 0, LIGHT_SPEED, EARTH_GRAVITY, EARTH_RADIUS,  
ELLIPSOID_PARAM }`
- `enum brathl_refDate {  
REF19500101, REF19580101, REF19850101, REF19900101,  
REF20000101, REFUSER1, REFUSER2 }`

#### Variables

- `LIBRATHL_API char brathl_refDateUser1 [BRATHL_REF_DATE_USER_LEN]`
- `LIBRATHL_API char brathl_refDateUser2 [BRATHL_REF_DATE_USER_LEN]`

#### 9.1.1 Detailed Description

C/C++ general interface of BRATHL

#### 9.1.2 Macro Definition Documentation

##### 9.1.2.1 `#define BRATHL_CYCLE_LEN 60`

Maximum length of date reference string

##### 9.1.2.2 `#define BRATHL_MAX_ERRMSG_LEN 255`

Maximum length of error message string

##### 9.1.2.3 `#define BRATHL_REF_DATE_USER_LEN 28`

Maximum length of date reference string

Referenced by `FTN_NAME()`.

### 9.1.3 Typedef Documentation

#### 9.1.3.1 typedef struct **\_structDateDSM** brathl\_DateDSM

Day/seconds/microseconds date structureCreates a type name for **\_structDateDSM** (p. 98)

#### 9.1.3.2 typedef struct **\_structDateJulian** brathl\_DateJulian

Decimal julian date structureCreates a type name for **\_structDateJulian** (p. 99)

#### 9.1.3.3 typedef struct **\_structDateSecond** brathl\_DateSecond

Decimal seconds date structureCreates a type name for **\_structDateSecond** (p. 100)

#### 9.1.3.4 typedef struct **\_structDateYMDHMSM** brathl\_DateYMDHMSM

YYYY-MM-DD HH:MM:SS:MS date structureCreates a type name for **\_structDateYMDHMSM** (p. 100)

#### 9.1.3.5 typedef int brathl\_mission

Satellite (mission) ID -> On Brat V.4, mission ID is defined on txt file CMission::m\_refFileName

### 9.1.4 Enumeration Type Documentation

#### 9.1.4.1 enum brathl\_FileMode

Enumerator:

**Write** file exists, open read-only

**Replace** file exists, open for writing

**New** create new file, even if it already exists create new file, fail if it already exists

#### 9.1.4.2 enum brathl\_refDate

date reference enumeration Used to give a date a a start reference User can defined its own reference by using REFUSER1 and/or REFUSER2

Enumerator:

**REF19500101** reference to the 1950-01-01 00:00:00:00

**REF19580101** reference to the 1958-01-01 00:00:00:00

**REF19850101** reference to the 1985-01-01 00:00:00:00

**REF19900101** reference to the 1990-01-01 00:00:00:00

**REF20000101** reference to the 2000-01-01 00:00:00:00

**REFUSER1** reference to a user-defined date **brathl\_refDateUser1** (p. 338)

**REFUSER2** reference to a second user-defined date **brathl\_refDateUser2** (p. 338)

### 9.1.5 Variable Documentation

#### 9.1.5.1 LIBRATHL\_API char brathl\_refDateUser1[BRATHL\_REF\_DATE\_USER\_LEN]

Global variable to define REFUSER1 date (see **brathl\_refDate** (p. 338))

Referenced by brathl::CDate::ConstructDate(), and FTN\_NAME().

#### 9.1.5.2 LIBRATHL\_API char brathl\_refDateUser2[BRATHL\_REF\_DATE\_USER\_LEN]

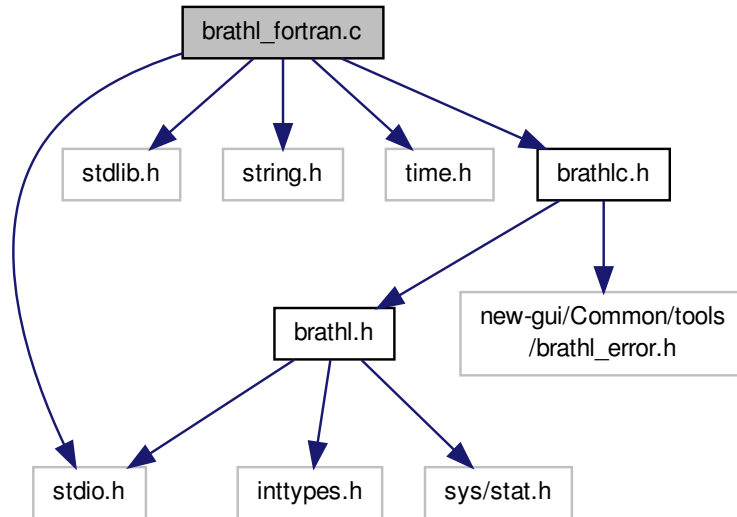
Global variable to define REFUSER2 date (see **brathl\_refDate** (p. 338))

Referenced by brathl::CDate::ConstructDate(), and FTN\_NAME().

## 9.2 brathl\_fortran.c File Reference

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <time.h>
#include "brathlc.h"
```

Include dependency graph for brathl\_fortran.c:



### Macros

- `#define _(A, B) AB`
- `#define _2(A, B) AB`
- `#define _3(A, B, C) ABC`
- `#define _cleft 1`
- `#define _cleft_cfright 0`
- `#define _cfright`
- `#define ANSI_C_preprocessor _cleft_cfright`
- `#define FTN_NAME(Low, Up) ADD_UNDERSCORE(Low)`
- `#define INTEGER4 int32_t`
- `#define MIN(A, B) ((A) < (B) ? (A) : (B))`
- `#define REAL8 double`
- `#define SECOND_UNDERSCORE(X) X`

### Functions

- void **FTN\_NAME** (brathlf\_setrefuser1, BRATHLF\_SETREFUSER1)
- void **FTN\_NAME** (brathlf\_setrefuser2, BRATHLF\_SETREFUSER2)
- INTEGER4 **FTN\_NAME** (brathlf\_geterrno, BRATHLF\_GETERRNO)
- void **FTN\_NAME** (brathlf\_errno2string, BRATHLF\_ERRNO2STRING)
- INTEGER4 **FTN\_NAME** (brathlf\_seconds2dsm, BRATHLF\_SECONDS2DSM)
- INTEGER4 **FTN\_NAME** (brathlf\_dsm2seconds, BRATHLF\_DSM2SECONDS)

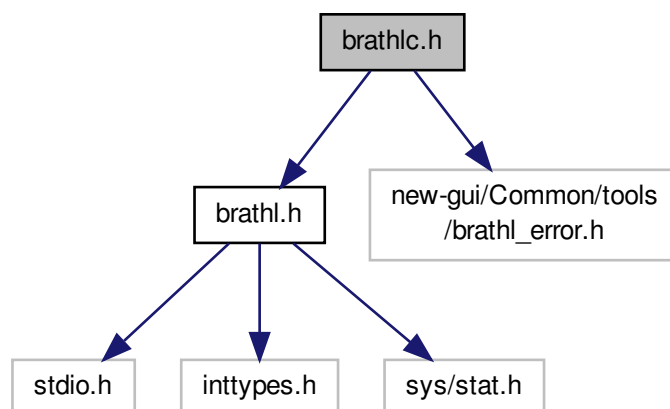
- INTEGER4 **FTN\_NAME** (brathlf\_julian2dsm, BRATHLF\_JULIAN2DSM)
- INTEGER4 **FTN\_NAME** (brathlf\_dsm2julian, BRATHLF\_DSM2JULIAN)
- INTEGER4 **FTN\_NAME** (brathlf\_ymdhmsm2dsm, BRATHLF\_YMDHMSM2DSM)
- INTEGER4 **FTN\_NAME** (brathlf\_dsm2ymdhmsm, BRATHLF\_DSM2YMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_seconds2julian, BRATHLF\_SECONDS2JULIAN)
- INTEGER4 **FTN\_NAME** (brathlf\_julian2seconds, BRATHLF\_JULIAN2SECONDS)
- INTEGER4 **FTN\_NAME** (brathlf\_seconds2ymdhmsm, BRATHLF\_SECONDS2YMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_ymdhmsm2seconds, BRATHLF\_YMDHMSM2SECONDS)
- INTEGER4 **FTN\_NAME** (brathlf\_julian2ymdhmsm, BRATHLF\_JULIAN2YMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_ymdhmsm2julian, BRATHLF\_YMDHMSM2JULIAN)
- INTEGER4 **FTN\_NAME** (brathlf\_nowymdhmsm, BRATHLF\_NOWYMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_dayofyear, BRATHLF\_DAYOFYEAR)
- INTEGER4 **FTN\_NAME** (brathlf\_diffymdhmsm, BRATHLF\_DIFFYMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_diffdsm, BRATHLF\_DIFFDSM)
- INTEGER4 **FTN\_NAME** (brathlf\_diffjulian, BRATHLF\_DIFFJULIAN)
- INTEGER4 **FTN\_NAME** (brathlf\_cycle2ymdhmsm, BRATHLF\_CYCLE2YMDHMSM)
- INTEGER4 **FTN\_NAME** (brathlf\_ymdhmsm2cycle, BRATHLF\_YMDHMSM2CYCLE)
- INTEGER4 **FTN\_NAME** (brathlf\_readdata, BRATHLF\_READDATA)
- static char \* **GetFtnString** (const char \*FtnString, int32\_t FtnLength)
- static char \*\* **GetFtnStringArray** (const char \*FtnString, int32\_t FtnLength, int32\_t ArraySize)
- static int32\_t **GetFtnStringLen** (const char \*FtnString, int32\_t FtnLength)
- static void **PutFtnString** (char \*FtnString, int32\_t FtnLength, const char \*CString)
- static void **PutFtnStringArray** (char \*FtnString, int32\_t FtnLength, int32\_t ArraySize, const char \*\*CStrings)

### 9.2.1 Detailed Description

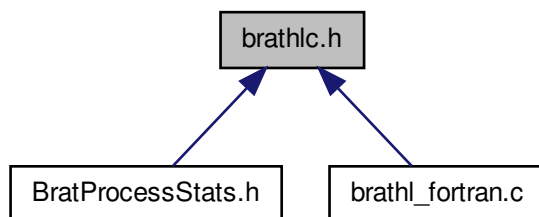
Fortran general interface of BRATHL no .h file since it is only called from fortran

## 9.3 brathlc.h File Reference

```
#include "brathl.h"
#include "new-gui/Common/tools/brathl_error.h"
Include dependency graph for brathlc.h:
```



This graph shows which files directly or indirectly include this file:



### Functions

- LIBRATHL\_API int32\_t **brathl\_Cycle2YMDHMSM** (**brathl\_mission** mission, uint32\_t cycle, uint32\_t pass, **brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API int32\_t **brathl\_DayOfYear** (**brathl\_DateYMDHMSM** \*dateYMDHMSM, uint32\_t \*dayOfYear)
- LIBRATHL\_API int32\_t **brathl\_DiffDSM** (**brathl\_DateDSM** \*dateDSM1, **brathl\_DateDSM** \*dateDSM2, double \*diff)
- LIBRATHL\_API int32\_t **brathl\_DiffJulian** (**brathl\_DateJulian** \*dateJulian1, **brathl\_DateJulian** \*dateJulian2, double \*diff)
- LIBRATHL\_API int32\_t **brathl\_DiffYMDHMSM** (**brathl\_DateYMDHMSM** \*dateYMDHMSM1, **brathl\_DateYMDHMSM** \*dateYMDHMSM2, double \*diff)
- LIBRATHL\_API int32\_t **brathl\_DSM2Julian** (**brathl\_DateDSM** \*dateDSM, **brathl\_refDate** refDate, **brathl\_DateJulian** \*dateJulian)
- LIBRATHL\_API int32\_t **brathl\_DSM2Seconds** (**brathl\_DateDSM** \*dateDSM, **brathl\_refDate** refDate, **brathl\_DateSecond** \*dateSeconds)
- LIBRATHL\_API int32\_t **brathl\_DSM2YMDHMSM** (**brathl\_DateDSM** \*dateDSM, **brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API const char \* **brathl\_Errno2String** (const int32\_t err)
- LIBRATHL\_API int32\_t **brathl\_Julian2DSM** (**brathl\_DateJulian** \*dateJulian, **brathl\_refDate** refDate, **brathl\_DateDSM** \*dateDSM)
- LIBRATHL\_API int32\_t **brathl\_Julian2Seconds** (**brathl\_DateJulian** \*dateJulian, **brathl\_refDate** refDate, **brathl\_DateSecond** \*dateSeconds)
- LIBRATHL\_API int32\_t **brathl\_Julian2YMDHMSM** (**brathl\_DateJulian** \*dateJulian, **brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API void **brathl\_LoadAliasesDictionary** ()
- LIBRATHL\_API int32\_t **brathl\_NowYMDHMSM** (**brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API int32\_t **brathl\_ReadData** (int32\_t nbFiles, char \*\*fileNames, const char \*recordName, const char \*selection, int32\_t nbData, char \*\*dataExpressions, char \*\*units, double \*\*results, int32\_t sizes[], size\_t \*actualSize, int ignoreOutOfRange, int statistics, double defaultValue)
- LIBRATHL\_API void **brathl\_RegisterAlgorithms** ()
- LIBRATHL\_API int32\_t **brathl\_Seconds2DSM** (**brathl\_DateSecond** \*dateSeconds, **brathl\_refDate** refDate, **brathl\_DateDSM** \*dateDSM)
- LIBRATHL\_API int32\_t **brathl\_Seconds2Julian** (**brathl\_DateSecond** \*dateSeconds, **brathl\_refDate** refDate, **brathl\_DateJulian** \*dateJulian)
- LIBRATHL\_API int32\_t **brathl\_Seconds2YMDHMSM** (**brathl\_DateSecond** \*dateSeconds, **brathl\_DateYMDHMSM** \*dateYMDHMSM)
- LIBRATHL\_API int32\_t **brathl\_YMDHMSM2Cycle** (**brathl\_mission** mission, **brathl\_DateYMDHMSM** \*dateYMDHMSM, uint32\_t \*cycle, uint32\_t \*pass)

- LIBRATHL\_API int32\_t **brathl\_YMDHMSM2DSM** (**brathl\_DateYMDHMSM** \*dateYMDHMSM, **brathl\_refDate** refDate, **brathl\_DateDSM** \*dateDSM)
- LIBRATHL\_API int32\_t **brathl\_YMDHMSM2Julian** (**brathl\_DateYMDHMSM** \*dateYMDHMSM, **brathl\_refDate** refDate, **brathl\_DateJulian** \*dateJulian)
- LIBRATHL\_API int32\_t **brathl\_YMDHMSM2Seconds** (**brathl\_DateYMDHMSM** \*dateYMDHMSM, **brathl\_refDate** refDate, **brathl\_DateSecond** \*dateSeconds)

#### Variables

- LIBRATHL\_API int **brathl\_errno**

### 9.3.1 Detailed Description

C general interface of BRATHL

### 9.3.2 Function Documentation

#### 9.3.2.1 LIBRATHL\_API const char\* brathl\_Errno2String ( const int32\_t err )

Retrieve a string with the error description

With a few exceptions almost all BRATHL functions return an integer that indicate whether the function was able to perform its operations successfully. The return value will be 0 on success and < 0 otherwise. The result is also save in the global variable **brathl\_errno** (p. 342) In case you get a negative value.

#### Parameters

<i>in</i>	<i>err</i>	: error code
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#### Returns

string error description

### 9.3.3 Variable Documentation

#### 9.3.3.1 LIBRATHL\_API int brathl\_errno

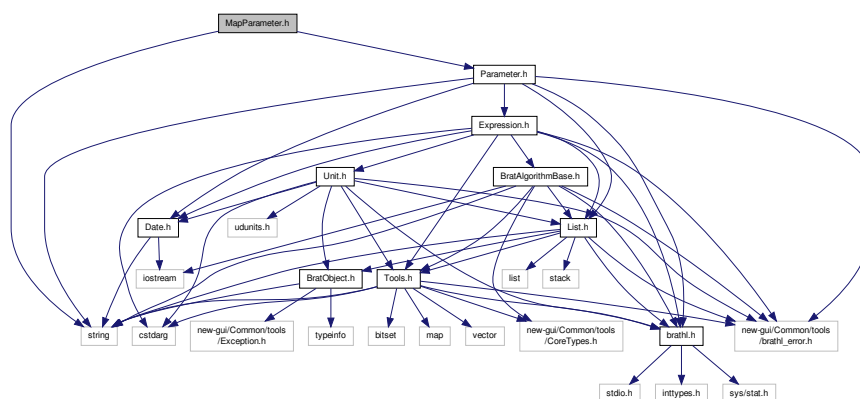
Global variable to save error code

## 9.4 MapParameter.h File Reference

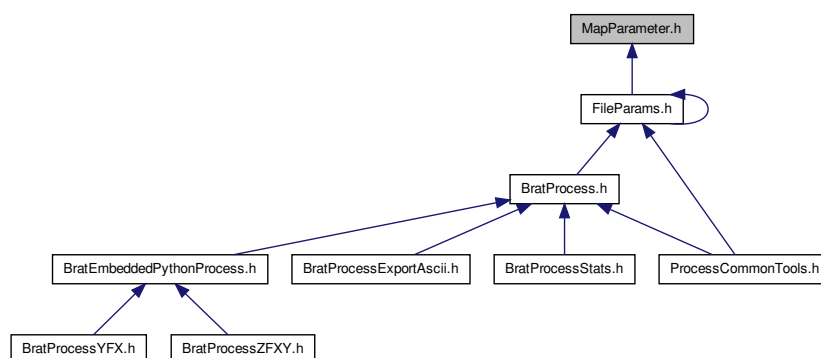
```
#include <string>
#include "Parameter.h"
```



Include dependency graph for MapParameter.h:



This graph shows which files directly or indirectly include this file:



## Classes

- class **brathl::CMapParameter**

## Namespaces

- namespace **brathl**

## Typedefs

- typedef std::map< std::string,  
**CParameter** \* > **brathl::map\_parameter**

### 9.4.1 Detailed Description

Class definition file