SPHERLSanal

1.0

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4.1 /home/cgeroux/WORK/SPHERLS/scripts/ Directory Reference

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- file **test_calculation.py**
- file **test_restart.py**
- file **work_plot.py**
- file **xmlParseFunctions.py**

Chapter 5

Class Documentation

5.1 plot_file::Axis Class Reference

Public Member Functions

- def __init__
- def load

Public Attributes

- **plots**
- **xlabel**
- **limits**
- **bMinorTics**
- **grid**

5.1.1 Detailed Description

```
This class holds all the information needed for a particular x-axis. An axis can either be
either of time, or of some column in the data files.
```

5.1.2 Member Function Documentation

5.1.2.1 def plot_file::Axis::__init__ (*self*, *element*, *options*)

```
This function initizalizes the axis object.
```

5.1.2.2 def plot_file::Axis::load (*self*, *files*, *options*)

```
This function loads the values needed for the x-axis data from the fileData argument
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/plot_file.py

5.2 plot_profile::Axis Class Reference

Public Member Functions

- def __init__
- def load

Public Attributes

- **plots**
- **bTime**
- **period**
- **nColumn**
- **xlabel**
- **x**
- **formulaOrig**
- **formula**
- **phase**
- **code**
- **limits**
- **bMinorTics**
- **grid**

5.2.1 Detailed Description

```
This class holds all the information needed for a particular x-axis. An axis can either be
either of time, or of some column in the data files.
```

5.2.2 Member Function Documentation

5.2.2.1 def plot_profile::Axis::__init__ (*self*, *element*, *options*)

```
This function initizalizes the axis object.
```

5.2.2.2 def plot_profile::Axis::load (*self*, *fileData*, *options*)

```
This function loads the values needed for the x-axis data from the fileData argument
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/plot_profile.py

5.3 plot_profile::Curve Class Reference

Public Member Functions

- def __init__
- def load

Public Attributes

- **nColumn**
- **zone**
- **nCurveIDForZoneRef**
- **y**
- **index**
- **bTime**
- **formulaOrig**
- **code**
- **style**
- **color**
- **markersize**
- **linewidth**
- **testZoneAdjust**
- **label**

5.3.1 Detailed Description

```
This class holds all the information for a curve on a plot.
```

5.3.2 Member Function Documentation

5.3.2.1 def plot_profile::Curve::__init__ (*self*, *element*, *type*)

```
This method initilizes a curve object, the type parameter allows checking curve syntax
against axis syntax to see if they match.
```

5.3.2.2 def plot_profile::Curve::load (*self*, *fileData*, *options*)

```
This method adds a y value and index to the curve for the current fileData.
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/plot_profile.py

5.4 plot_file::Curve Class Reference

Public Member Functions

- def __init__
- def load

Public Attributes

- **nColumnX**
- **nColumnY**
- **nColumnErr**
- **y**
- **x**
- **error**
- **index**
- **formulaOrigY**
- **formulaOrigX**
- **formulaOrigErr**
- **formulaX**
- **formulaY**
- **formulaErr**
- **codeY**
- **codeX**
- **codeErr**
- **style**
- **color**
- **markersize**
- **linewidth**
- **label**
- **fileReference**
- **nRowShiftErr**
- **nRowShiftX**
- **nRowShiftY**
- **marker**
- **ecolor**
- **elinewidth**
- **capsize**

5.4.1 Detailed Description

```
This class holds all the information for a curve on a plot.
```

5.4.2 Member Function Documentation

5.4.2.1 def plot_file::Curve::__init__ (*self*, *element*)

```
This method initilizes a curve object, the type parameter allows checking curve syntax
against axis syntax to see if they match.
```

5.4.2.2 def plot_file::Curve::load (*self*, *files*, *options*)

```
This method adds a y value and index to the curve for the current fileData.
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/plot_file.py

5.5 datafile::DataFile Class Reference

Public Member Functions

- def **setFileSize**
- def readFile
- def readFileFixed
- def readFileUnFixed

Static Public Attributes

- **sColumnNames** = None
- **fColumnValues** = None
- **sHeader** = None

5.5.1 Detailed Description

```
A generic class for holding a file consisting of a header and columns of floats
```

5.5.2 Member Function Documentation

5.5.2.1 def datafile::DataFile::readFile (*self*, *sFileName*)

```
a wrapper to determine which readFile function should be used
```

5.5.2.2 def datafile::DataFile::readFileFixed (*self*, *sFileName*)

```
Reads in a file when the size has already been set using \ref setFileSize, or by a previous
file read using \ref readFileUnFixed.
```

5.5.2.3 def datafile::DataFile::readFileUnFixed (*self*, *sFileName*)

```
Reads in a file when the size is not fixed and needs to be determined from the input file
being read in
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/datafile.py

5.6 plot_file::DataSet Class Reference

Public Member Functions

- def __init__
- def load
- def getCurve

Public Attributes

- **axes**
- **files**

5.6.1 Detailed Description

```
This class holds all the information for a single dataSet, which includes the baseFileName of
the dataset, the range of the dataSet (start-end), the times and phases of the files within the
range of the dataSet, and the plots made from the dataSet.
```

5.6.2 Member Function Documentation

5.6.2.1 def plot_file::DataSet::__init__ (*self*, *element*, *options*)

```
Initilizes the dataSet by setting baseFileName, start, end, and intilizing plots from an xml
element
```

5.6.2.2 def plot_file::DataSet::load (*self*, *options*)

```
Loads the dataSet, this means that it sets, time, phases, and plots data
```

5.6.2.3 def plot_file::DataSet::getCurve (*self*, *ID*)

```
Returns a curve object that has ID, ID
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/plot_file.py

5.7 plot_profile::DataSet Class Reference

Public Member Functions

- def __init__
- def load
- def getCurve

Public Attributes

- **baseFileName**
- **start**
- **end**
- **axes**
- **nNumFiles**
- **fileIndices**
- **hasNonTimeAxis**

5.7.1 Detailed Description

```
This class holds all the information for a single dataSet, which includes the baseFileName of
the dataset, the range of the dataSet (start-end), the times and phases of the files within the
range of the dataSet, and the plots made from the dataSet.
```

5.7.2 Member Function Documentation

5.7.2.1 def plot_profile::DataSet::__init__ (*self*, *element*, *options*)

```
Initilizes the dataSet by setting baseFileName, start, end, and intilizing plots from an xml
element
```

5.7.2.2 def plot_profile::DataSet::load (*self*, *options*)

```
Loads the dataSet, this means that it sets, time, phases, and plots data
```

5.7.2.3 def plot_profile::DataSet::getCurve (*self*, *ID*)

```
Returns a curve object that has ID, ID
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/plot_profile.py

5.8 eos_interp::eosTable Class Reference

Public Member Functions

- def load
- def write
- def plotLogE
- def plotLogP
- def interpolate
- def __init__

Public Attributes

- **status**
- **X**
- **Z**
- **logT**
- **logD**
- **logP**
- **logE**
- **sFileName**

5.8.1 Detailed Description

```
Holds equation of state data.
```

5.8.2 Member Function Documentation

5.8.2.1 def eos_interp::eosTable::load (*self*)

```
Reads in an OPAL equation of state file.

It puts the resulting file info into:
self.X: the hydrogen mass fraction
self.Z: the metal mass fraction
self.logD: numpy array of log density grid points [g/cm^3]
self.logT: numpy array of log tempeature grid points [K]
self.logE: numpy array of log energy [ergs/g]
self.logP: numpy array of log pressure [dynes/cm^2]

self.logD, self.logT, self.logE, and self.logP are all the same size numpy arrays, empty
emelents have logE and logP as nans.
```

5.8.2.2 def eos_interp::eosTable::write (*self*, *args*)

```
Generic write function that calls either writeToScreen, or writeToFiel depending on if a
file name is specified or not.
```

5.8.2.3 def eos_interp::eosTable::plotLogE (*self*, *otherTables* = None, *logDIndexList* = None, *wireFrame* = True)

```
Plots LogE

Keywords:
otherTables: a list of other eosTables to include in the plot
logDIndexList: a list of integers corresponding to which densities to plot the tables at
wireFrame: if set to true (the default) and logDIndexList is set to None it will plot a 3D
  wireframe of logE.
```

5.8.2.4 def eos_interp::eosTable::plotLogP (*self*, *otherTables* = None, *logDIndexList* = None, *wireFrame* = True)

```
Plots LogP

Keywords:
otherTables: a list of other eosTables to include in the plot
logDIndexList: a list of integers corresponding to which densities to plot the tables at
wireFrame: if set to true (the default) and logDIndexList is set to None it will plot a 3D
  wireframe of logP.
```

5.8.2.5 def eos_interp::eosTable::interpolate (*self*, *gridConfig*, *setExtrapolatedToNan* = True)

```
Interpolate from self's table to the griding specified by:

logDMin: first (smallest) logD value of grid
logDDel: spacing in logD
numLogD: number of logD grid points
logTMin: first (smallest) logT value of grid
logTDel: spacing in logT
numLogT: number of logT grid points
```

5.8.2.6 def eos_interp::eosTable::__init__ (*self*, *sFileName* = None)

```
Returns a new instance of eosTable.

If sFileName is set it will use that to set the filename to load the data from.
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/eos_interp.py

5.9 eos_interp::eosTableManager Class Reference

Public Member Functions

- def load
- def interpComp
- def plotGrid
- def getTableFromComp
- def __init__

Public Attributes

- **Z**
- **X**
- **eosFileName**
- **eosTables**

5.9.1 Detailed Description

```
Manages equation of state files, including how they are interpolated between.
```

5.9.2 Member Function Documentation

5.9.2.1 def eos_interp::eosTableManager::load (*self*)

```
Loads eos files.

Sets the following:
self.Z: a list of Z (metal mass fraction) values of the equation of state files
self.X: a list of X (hydrogen mass fraction) values of the equation of state files
```

5.9.2.2 def eos_interp::eosTableManager::interpComp (*self*, *X*, *Z*)

```
Interpolates a set of eos files and opacities to the desired X and Z, and returns an
eosManager with this new set of files which can then be interpolated to the desired rho and
T's.
```

5.9.2.3 def eos_interp::eosTableManager::plotGrid (*self*, *eosIndex*)

```
Plot rho and T points that form the grid
```

5.9.2.4 def eos_interp::eosTableManager::getTableFromComp (*self*, *X*, *Z*)

```
Returns a shallow copy of the eos table with matching composition. If none found it returns
None.
```

5.9.2.5 def eos_interp::eosTableManager::__init__ (*self*, *eosFileName* = None)

```
Returns a new instance of eosTableManager.

if eosFileName is set it will call __initFromFile to load settings from a file to initialize
the new eosTableManager.
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/eos_interp.py

5.10 eos_interp::interpTable Class Reference

Public Member Functions

- def interpolate
- def read
- def plotLogE
- def plotLogP
- def plotLogK
- def __init__

Public Attributes

- **eosAtNewComp**
- **opacityAtNewComp**
- **eosTable**
- **opacityTable**
- **sFileName**
- **numLogR**
- **X**
- **Z**
- **gridConfig**
- **logD**
- **logT**
- **logP**
- **logE**
- **logK**
- **outputFile**
- **plot**

5.10.1 Detailed Description

```
This class reads in and holds data for an equations of state and opacities from a file formated
in the same was as read to and written by the class defined in eos.h, and implemented in eos.cpp.
```

5.10.2 Member Function Documentation

5.10.2.1 def eos_interp::interpTable::interpolate (*self*, *eosSet*, *opacitySet*, *withoutNans* = `False`)

```
creates the interpolated table and writes it out
```

5.10.2.2 def eos_interp::interpTable::read (*self*, *sFilename*)

```
Reads in an interpolated table
```

5.10.2.3 def eos_interp::interpTable::plotLogE (*self*, *otherTables* = None, *logDIndexList* = None, *logDRangeList* = None, *wireFrame* = True, *rstride* = 1, *cstride* = 1)

```
Plots LogE

Keywords:
otherTables: a list of other eosTables to include in the plot
logDIndexList: a list of integers corresponding to which densities to plot the tables at
wireFrame: if set to true (the default) and logDIndexList is set to None it will plot a 3D
  wireframe of logE.
```

5.10.2.4 def eos_interp::interpTable::plotLogP (*self*, *otherTables* = None, *logDIndexList* = None, *logDRangeList* = None, *wireFrame* = True)

```
Plots LogP

Keywords:
otherTables: a list of other eosTables to include in the plot
logDIndexList: a list of integers corresponding to which densities to plot the tables at
wireFrame: if set to true (the default) and logDIndexList is set to None it will plot a 3D
  wireframe of logP.
```

5.10.2.5 def eos_interp::interpTable::plotLogK (*self*, *otherTables* = None, *logDIndexList* = None, *logDRangeList* = None, *wireFrame* = True)

```
Plots opacity

Keywords:
otherTables: a list of opacity tables to also be ploted
logDIndex: a list of integers used to indicate a specific logR index to plot 2D line plots at.
```

5.10.2.6 def eos_interp::interpTable::__init__ (*self*, *tableElement* = None)

```
Reads in an interpolation table info from from the xml element tableElement.
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/eos_interp.py

5.11 eos_interp::opacityTable Class Reference

Public Member Functions

- def load
- def plotLogK
- def interpolate
- def __init__
- def fillInDepNans

Public Attributes

- **multitableFile**
- **X**
- **Z**
- **sFileName**
- **logT**
- **logR**
- **logK**

5.11.1 Detailed Description

```
Holds opacity table data.

Initialize with a composition (X,Z), file name and weather the file name contains multiple.
```

5.11.2 Member Function Documentation

5.11.2.1 def eos_interp::opacityTable::load (*self*)

```
Load from a file an opacity table for composition of the current opacity object.
It does this by advancing a file until the composition is matched and then calls
__loadTableFromFile to load the logR, logT, and logK values.
```

5.11.2.2 def eos_interp::opacityTable::plotLogK (*self*, *otherTables* = None, *logRIndex* = None, *wireFrame* = True)

```
Plots opacity

Keywords:
otherTables: a list of opacity tables to also be ploted
logRIndex: a list of integers used to indicate a specific logR index to plot 2D line plots at.
```

5.11.2.3 def eos_interp::opacityTable::interpolate (*self*, *gridConfig*, *setExtrapolatedToNan* = True)

```
Interpolate from self's table to the griding specified by:

paramters:
logDMin: first (smallest) logD value of grid
logDDel: spacing in logD
numLogD: number of logD grid points
logTMin: first (smallest) logT value of grid
logTDel: spacing in logT
numLogT: number of logT grid points

keyword:
setExtrapolatedToNan: controls weather extrapolated points are set to nans (default is True)

returns:
an opacity table interpolated to the specified grid. In addition to the regular members of an
opacity table logD is also included.
```

5.11.2.4 def eos_interp::opacityTable::__init__ (*self*, *X* = None, *Z* = None, *sFileName* = None, *multitableFile* = None)

```
Initializes the opacity object.

sets:
self.X: the hydrogen mass fraction
self.Z: the metal mass fraction
self.sFileName: the file name to load the table from
self.multitableFile: weather or not the file has more than one table in it
```

5.11.2.5 def eos_interp::opacityTable::fillInDepNans (*self*)

```
Fills in logR and logT values to make a rectangular grid
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/eos_interp.py

5.12 eos_interp::opacityTableManager Class Reference

Public Member Functions

- def load
- def interpComp
- def plotGrids
- def getTableFromComp
- def __init__

Public Attributes

- **opacityConfigFileName**
- **opacityFileNames**
- **opacityTables**
- **Z**
- **X**

5.12.1 Detailed Description

```
Manages opacity files, including how they are interpolated between in composition.
```

5.12.2 Member Function Documentation

5.12.2.1 def eos_interp::opacityTableManager::load (*self*)

```
Loads opacity files and merge files at duplicate compositions (i.e. merges low and high
temperature opacity tables).

Sets the following:
self.X: list of hydrogen mass fractions convered by opacity tables
self.Z: list of metal mass fractions covered by opacity tables
```

5.12.2.2 def eos_interp::opacityTableManager::interpComp (*self*, *X*, *Z*)

```
Interpolates a set of opacity files to the desired X and Z, and returns an the interpolated
opacityTable.

Parameters:
X: hydrogen mass fraction
Z: metal mass fraction
```

5.12.2.3 def eos_interp::opacityTableManager::plotGrids (*self*, *opacityIndex*)

```
Plot LogR and LogT points that form the opacity grid.

Parameters:
opacityIndex: a list of integers used to select which opacity tables will be plotted
```

5.12.2.4 def eos_interp::opacityTableManager::getTableFromComp (*self*, *X*, *Z*)

```
Returns a shallow copy of the opacity table with matching composition.
```

5.12.2.5 def eos_interp::opacityTableManager::__init__ (*self*, *opacityConfigFile* = None)

```
Creates a new instance of opacityTableManager.

If opacityConfigFile is set it will try to parse it for xml settings to get all the file names
of the opacity files to include in the opacityTableManager.
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/eos_interp.py

5.13 plot_file::Plot Class Reference

Public Member Functions

- def __init__
- def load

Public Attributes

- **ylabel**
- **curves**
- **limits**
- **grid**
- **bMinorTics**
- **legendloc**

5.13.1 Detailed Description

```
This class holds all the information for a single plot, namely the list of curves for that plot.
```

5.13.2 Member Function Documentation

5.13.2.1 def plot_file::Plot::__init__ (*self*, *element*)

```
This method initlizes the plot object
```

5.13.2.2 def plot_file::Plot::load (*self*, *files*, *options*)

```
loads the data for a plot, y-data is stored in the curves, and sets the ylabel from the first
file read in
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/plot_file.py

5.14 plot_profile::Plot Class Reference

Public Member Functions

- def __init__
- def load

Public Attributes

- **ylabel**
- **curves**
- **limits**
- **grid**
- **bMinorTics**
- **legendloc**

5.14.1 Detailed Description

```
This class holds all the information for a single plot, namely the list of curves for that plot.
```

5.14.2 Member Function Documentation

5.14.2.1 def plot_profile::Plot::__init__ (*self*, *element*, *type*)

```
This method initlizes the plot object
```

5.14.2.2 def plot_profile::Plot::load (*self*, *fileData*, *options*)

```
loads the data for a plot, y-data is stored in the curves, and sets the ylabel from the first
file read in
```

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

- /home/cgeroux/WORK/SPHERLS/scripts/plot_profile.py

Chapter 6

File Documentation

6.1 /home/cgeroux/WORK/SPHERLS/scripts/cp_files.py File Reference

Namespaces

- namespace **cp_files**

Functions

- def cp_files::main
  Documentation for a function.
- def cp_files::cp_files
  Documentation for a function.

6.1.1 Detailed Description

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