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Skyrad.pack\_V5.0/dtform: - 2/8 -

- Format conversion of data files for analyses -

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1. History

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2006.04.20 Renewal Version 4.2 is fixed by M.Yamano

2024.01.17 Version 5.0 is fixed by M.Hashimoto

2. List of contents

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In the directory dtform/ there are the following three files for

'dtform' processing and this document 'ReadMe\_dtform.doc'.

. dtform : the main part of source program file 'dtform.f'

. dtform.f : full source program file for format conversion of

data files.

. dtform.par: parameters/options file for 'dtform' processing.

3. Procedure for 'dtform' processing

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3-1. Setting of 'dtform.par'

The contents of 'dtform.par' are as follows.

0 0 1 0 0 : IDT3 IDT4 IDT5 ILST IDBG(output option) - 1:create / 0:not

0 : IANG(angle correction option) - 1:correct/ 0:not

"obs.para.example" : observation parameter file name

"ins.para.example" : instrument parameter file name

"CCD.para.example" : CCD parameter file name (be read if IANG>0)

IDT3, IDT4, IDT5, ILST and IDBG are flags for output options.

If it is positve, files corresponding to it are made.

If IDT3>0, input data files for analysis Ver.3.3(DT3/\*.DT3) are made.

If IDT4>0, input data files for analysis Ver.4.2(DT4/\*.DT4) are made.

If IDT5>0, input data files for analysis Ver.5 (DT5/\*.DT5) are made.

If ILST>0, list files of measurement data(Lst/\*.lst) are made.

If IDBG>0, some files for information on angles are made in case of

ship-born data.

IANG is the option flag for correction of angles for ship-born data.

If it is positive, pitching and rolling of ship is taken into

consideration, when ship-born data are processed.

File names of observation conditions files, 'obs.para'(information

on observation) and 'ins.para'(information on instrument) are set.

If correction of angles is performed (IANG>0), the name of 'CCD.para'

(parameters for angle sensors) is also set.

3-2. Inputs

Input files for 'dtform' processing are data files of measurements

by PREDE sky radiometers. They are daily files. There are several

types for name and data format of files.

yymmddnn.dat

or yyyymmdd.dat

or yymmdd.DAT

Here 'yy' or 'yyyy' gives year, 'mm' - month, 'dd' - day and 'nn'

gives a serial number.

All file names are written as \*.dat from here.

3-3. 'dtform' processing

(1) Make directory DAT/ and store data files(\*.dat) in DAT/

mkdir DAT

mv \*.dat DAT

(2) Make output directories DT5/ (DT4/, DT3/, Lst/) and Tag/

Directories corresponding to positive flags IDT5 (IDT4, IDT3, ILST)

and directory Tag/ for 'tag' files(\*.tag) are made.

mkdir DT5 (DT4, DT3 Lst) Tag

(3) Make 'fname' file

'fname' is a list of data files that will be processed.

Data for 'fname' are given as file names with or without extension.

For example, the following A. and B. are equivalent.

A. B.

02012900 02012900.dat

02013000 02013000.dat

02013100 02013100.dat

: :

\* 'fname' of type B. is made automatically by means of the following

procedure.

cd DAT

ls -1 \*.dat > ../fname

cd ../

(4) Run 'dtform.e'

An executable file 'dtform.e' for the source file 'dtform.f' is

executed. 'obs.para' and 'ins.para' files that are specified in

'dtform.par' are necessary for execution.

dtform.e

3-4. Outputs

Output files for 'dtform' processing are as follows.

DT3/\*.DT3 : input data files for analysis Ver.3.3 (if IDT3>0)

DT4/\*.DT4 : input data files for analysis Ver.4.2 (if IDT4>0)

DT5/\*.DT5 : input data files for analysis Ver.5 (if IDT5>0)

Lst/\*.lst : list files of measurement data (if ILST>0)

Tag/\*.tag : 'tag' files for processed data

dtform.tag: 'tag' file for all processed data

dtform.log: processing log file

List files(\*.lst) are tables of header lines of measurement data.

'tag' files(\*.tag) are tables of information on measurements (date,

time, longitude, latitude, solar height and the maximum scattering

angle for measurement).

If data fail to be processed because of some error, an error message

is output to 'dtform.log' file. 'dtform.tag' is a merged file of all

'tag' files in Tag/.

4. Formats of output files

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4-1. Format of DT5/\*.DT5 and DT4/\*.DT4 files

An example for DT5/\*.DT5 and DT4/\*.DT4 files is as follows.

2003 5 29 5 20 2 5.3339 : IY IM ID IHH IMM ISS TM(hr)

135.00 139.32 35.75 0.00 : ALNGS ALNG ALAT ALT(m)

24 81.5 -110.4 1.0134 : NA TH0 FI0 DST

7 : NW/ WL

3.150E-05 4.000E-05 5.000E-05

6.750E-05 8.700E-05 9.400E-05

1.020E-04

TH FI F (IF SCA=0) or R=U/F/M/SOLID

81.5 0.0 1.0022E-09 81.5 0.0 5.4169E-07 81.5 0.0 8.4541E-06

81.5 0.0 4.4853E-05 81.5 0.0 6.5084E-05 81.5 0.0 4.5918E-06

81.5 0.0 7.0694E-05

81.5 2.0 0.0000E+00 81.5 2.0 2.7375E+00 81.5 2.0 1.5781E+00

81.5 2.0 9.3657E-01 81.5 2.0 8.3531E-01 81.5 2.0 1.0553E+00

81.5 2.0 8.9093E-01

81.5 3.0 0.0000E+00 81.5 3.0 2.3010E+00 81.5 3.0 1.2413E+00

81.5 3.0 7.1797E-01 81.5 3.0 4.9018E-01 81.5 3.0 4.4669E-01

81.5 3.0 3.9643E-01

: : : : : : : : :

The 1st record gives measuremet time:

year(IY), month(IM), day(ID), hour(IHH), min.(IMM), sec.(ISS) and

time in hour(TM(hr)).

The 2nd record gives measurement location:

longitude for time standard(ALNGS), longitude(ALNG), latitude(ALAT)

and altitude(ALT) of the observation site.

The 3rd record gives measurement condition:

number of scattering angles(NA), zenith(TH0) and azimuth(FI0) angles

of the Sun and the Sun-Earth distance in antronomical unit(DST).

The 4th and the following records give wavelengths:

number of wavelengths(NW) and wavelengths(WL(IW),IW=1,NW).

After a comment line (1 record) measurement data are given.

At the I-th scattering angle, for the IW-th wavelength

TH(IW,I) : zenith angle

FI(IW,I) : azimuth angle

AUR(IW,I): corrected measured value

\* Measured value(U(IW,I)) is corrected as follows.

AUR(IW,1)=U(IW,1)\*DST\*\*2 ... I = 1

AUR(IW,I)=U(IW,I)\*DST\*\*2/AUR(IW,1)/EM/SOLID(IW) ... I > 1

Here EM is air mass (= 1/COS(TH0)) and SOLID(IW) is solid view

angle of the IW-th wavelength.

The program code for reading of one measurement data is as follows.

READ(IU,\*) IY,IM,ID,JH,JM,JS,TM

READ(IU,\*) ALNGS,ALNG,ALAT,ALT

READ(IU,\*) NA,TH0,FI0,DST

READ(IU,\*) NW

READ(IU,\*) (WL(IW),IW=1,NW)

READ(IU,\*) CH <----- 1 record skipped.

DO I=1,NA

READ(IU,\*) (TH(IW,I),FI(IW,I),AUR(IW,I),IW=1,NW)

ENDDO

4-2. Format of DT3/\*.DT3 files

An example for DT3/\*.DT3 files is as follows.

2003 5 29 5 20 2 5.3339 : IY IM ID IHH IMM ISS TM(hr)

135.00 139.32 35.75 0.00 : ALNGS ALNG ALAT ALT(m)

24 81.5 -110.4 1.0134 : NA TH0 FI0 DST

7 : NW/ WL

0.315E-04 0.400E-04 0.500E-04 0.675E-04 0.870E-04

0.940E-04 0.102E-03

TH FI F(SCA=0) or R=U/F/M/SOLID

81.5 0.0 1.0022E-09 5.4169E-07 8.4541E-06 4.4853E-05 6.5084E-05

4.5918E-06 7.0694E-05

81.5 2.0 0.0000E+00 2.7375E+00 1.5781E+00 9.3657E-01 8.3531E-01

1.0553E+00 8.9093E-01

81.5 3.0 0.0000E+00 2.3010E+00 1.2413E+00 7.1797E-01 4.9018E-01

4.4669E-01 3.9643E-01

: : : : : :

The 1st record gives measuremet time:

year(IY), month(IM), day(ID), hour(IHH), min.(IMM), sec.(ISS) and

time in hour(TM(hr)).

The 2nd record gives measurement location:

longitude for time standard(ALNGS), longitude(ALNG), latitude(ALAT)

and altitude(ALT) of the observation site.

The 3rd record gives measurement condition:

number of scattering angles(NA), zenith(TH0) and azimuth(FI0) angles

of the Sun and the Sun-Earth distance in antronomical unit(DST).

The 4th and the following records give wavelengths:

number of wavelengths(NW) and wavelengths(WL(IW),IW=1,NW).

After a comment line (1 record) measurement data are given.

At the I-th scattering angle, for the IW-th wavelength

TH(I) : zenith angle

FI(I) : azimuth angle

AUR(IW,I): corrected measured value

\* Measured value(U(IW,I)) is corrected as follows.

AUR(IW,1)=U(IW,1)\*DST\*\*2 ... I = 1

AUR(IW,I)=U(IW,I)\*DST\*\*2/AUR(IW,1)/EM/SOLID(IW) ... I > 1

Here EM is air mass (= 1/COS(TH0)) and SOLID(IW) is solid view

angle of the IW-th wavelength.

The program code for reading of one measurement data is as follows.

READ(IU,\*) IY,IM,ID,JH,JM,JS,TM

READ(IU,\*) ALNGS,ALNG,ALAT,ALT

READ(IU,\*) NA,TH0,FI0,DST

READ(IU,\*) NW

READ(IU,\*) (WL(IW),IW=1,NW)

READ(IU,\*) CH <----- 1 record skipped.

DO I=1,NA

READ(IU,\*) TH(I),FI(I),(AUR(IW,I),IW=1,NW)

ENDDO

4-3. Format of Tag/\*.tag files

An example for Tag/\*.tag files is as follows.

No yyyy mm dd Hour Long Lat Hs SA(max)

1 2003 5 29 5.33 139.32 35.75 8.55 160.0

2 2003 5 29 5.67 139.32 35.75 12.38 150.0

3 2003 5 29 6.00 139.32 35.75 16.28 140.0

: : : : : : : : :

There are information on measurements: serial number(No), year(yyyy),

month(mm), day(dd), time(Hour), longitude(Long), latitude(Lat), solar

height(Hs) and the maximum scattering angle for measurement(SA(max))

in order from the left.

'tag' files(\*.tag) are used as inputs for analyses.

The program code for writing of 'tag' data is as follows.

IF (NTG.EQ.1) WRITE(IU,10)

10 FORMAT(' No yyyy mm dd Hour Long Lat Hs SA(max)')

WRITE(IU,20) NTG,IY,IM,ID,TM,ALNG,ALAT,HGT,SAMX

20 FORMAT(I4,I5,2I3,F6.2,F8.2,2F7.2,F6.1)

4-4. Format of Lst/\*.lst files

An example for Lst/\*.lst files is as follows.

1 03/05/28,20:20:02,03/05/29,05:20:02,H,Akiruno,TS\_POM01.obs

2 03/05/28,20:40:01,03/05/29,05:40:01,H,Akiruno,TS\_POM01.obs

3 03/05/28,21:00:02,03/05/29,06:00:02,H,Akiruno,TS\_POM01.obs

: : : : : : : :

This is a table of measurement headers. An explanation for the

contents of headers is given in the 4th chapter of ReadMe\_para.doc.

List files(\*.lst) are not used for analyses.

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