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Skyrad.pack\_V5.0/solid: - 5/8 -

- Calculation of solid view angles for instrument -

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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 Renewal Version 5.0 is fixed by M.Hashimoto

2. List of contents

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

'solid' processing and this document 'ReadMe\_solid.doc'.

. solid3m : the main part of source program file 'solid3m.f'

. solid3m.f: full source program file for calculation of

solid view angles for instrument.

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

3. Procedure for 'solid' processing

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3-1. Setting of 'solid.par'

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

0 0 0 : IMAP IFNC ILST(output option) - 1:create / 0:not

21 21 0.1 : NZ NA DA[deg] - (fixed)

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

IMAP, IFNC and ILST are flags for output options. If it is positive,

files corresponding to it are made.

If IMAP>0, files for x-y map data of intensity distribution(disk??.map)

are made.

If IFNC>0, files for data of response function(disk??.fnc) are made.

If ILST>0, list files of disk scan data(disk??.lst) are made.

NZ and NA are numbers of points of measurement grid in the zenithal

and the azimuthal directions respectively. DA is the interval in

degree between adjoining points. Values for these three parameters

must not be changed, because they are set in measurement.

The file name of 'ins.para'(information on instrument) is set.

3-2. Inputs

Input files for 'solid' processing are data files of disk scans by

PREDE sky radiometers. There are two types for name and data format

of files. New files(yymmddnn.V??) are daily and old files(DISK?.DAT)

are simple sequential files.

yymmddnn.V?? or DISK?.DAT

Here 'yy' gives year, 'mm' - month, 'dd' - day and 'nn' gives a serial

number. [??] or [?] is number of order for the respective wavelengths.

3-3. 'solid' processing

(1) Make directory DSK/ and store data files(\*.V?? or \*.DAT) in DSK/

mkdir DSK

mv \*.V?? (or \*.DAT) DSK

(2) 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. 'fname' for

other processings is also available, because the part of extension

is ignored. All data files with the respective extensions specified

by 'fname' are used for calculation.

When input files are DISK?.DAT, 'fname' has only one record (type C.).

A. B. C.

02012900 02012900.V01 DISK1.DAT

02013000 02013000.V01

02013100 02013100.V01

: :

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

procedure.

cd DSK

ls -1 \*.V01 > ../fname

cd ../

(3) Run 'solid3m.e'

An executable file 'solid3m.e' for the source file 'solid3m.f' is

executed. 'ins.para' file that is specified in 'solid.par' is

necessary for execution.

solid3m.e

3-4. Outputs

Output files for 'solid' processing are as follows.

SVA.out : solid view angles for all wavelengths

disk??.out: solid view angles for the respective wavelength

disk??.map: x-y map data of intensity distribution (if IMAP>0)

disk??.fnc: data of response function (if IFNC>0)

disk??.lst: list files of disk scan data (if ILST>0)

disk??.log: processing log file

SVA.out is a merged file of all disk??.out files. The other files

are made for the wavelength corresponding to the number of order [??].

List files(disk??.lst) are tables of header lines of disk scan data.

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

is output to 'disk??.log' file.

4. Formats of output files

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4-1. Format of SVA.out (disk??.out) file

An example for SVA.out (disk??.out) file is as follows.

CH = 3 WL = 0.500

No YYYY MM DD HR X0 Y0 Lambda Beta SVA error

1 2003 5 28 8.117 0.411 -0.108 69.97 0.7474 8.086E-04 6.399E-01

2 2003 5 28 12.243 0.000 -0.003 -81.90 0.9632 2.301E-04 7.319E-02 \*

3 2003 5 28 13.382 -0.120 0.025 87.82 0.7851 1.852E-04 7.084E-01

4 2003 5 28 14.574 0.013 0.012 -47.79 0.9831 2.384E-04 5.318E-02 \*

5 2003 5 28 15.509 0.001 0.007 -36.89 0.9766 2.372E-04 4.637E-02 \*

6 2003 5 28 16.589 0.001 -0.005 -36.75 0.9766 2.376E-04 6.730E-02 \*

ave.( error < 0.2 ) = 2.358E-04 [ 4]

This is an output for the 3rd(CH) wavelength 0.5 micron(WL).

In order from the left the following data are given.

No : number of order for data

YYYY MM DD: year(YYYY), month(MM) and day(DD)

HR : time in hour

X0 Y0 : origin (center) of the ellipse-signals

Lambda : direction of major axis of the ellipse in degree

Beta : ratio of minor axis to major of the ellipse (< 1)

SVA : value of solid view angle in steradian

error : RMSD of measured and calculated vaules

The error is calculated for available signals, values of response

function of which are more than 0.005.

After a table of these data the average of available data which RMSD

is less than 0.2, is given. Available data are marked with '\*'.

4-2. Format of disk??.map file

An example for disk??.map file is as follows.

2 2003 5 28 12.243 0.000 -0.003 -81.90 0.9632 2.301E-04 7.319E-02 \*

-1.000 1.003 1.4357E+00 2.2617E-05 3.5746E-05

-1.000 0.903 1.3684E+00 4.8348E-05 5.8911E-05

-1.000 0.803 1.3053E+00 7.7245E-05 9.0366E-05

-1.000 0.703 1.2471E+00 1.0734E-04 1.3555E-04

-1.000 0.603 1.1944E+00 1.3086E-04 1.7198E-04

: : : : :

1.000 -0.597 1.1921E+00 1.7174E-04 1.7440E-04

1.000 -0.697 1.2444E+00 1.3633E-04 1.3542E-04

1.000 -0.797 1.3023E+00 1.0116E-04 8.8260E-05

1.000 -0.897 1.3651E+00 6.4351E-05 5.9761E-05

1.000 -0.997 1.4321E+00 2.5732E-05 3.5738E-05

A header(the 1st record) is a record of a table of disk??.out files

that correspons to this output.

After header a table of x-y map data of intensity distribution is

given. In order from the left

DX,DY: azimuthal and zenithal angles in degree relative to the

solar disk center

RM : distance between the point(DX,DY) and the solar disk center

AM :(normalized) measured intensity at the point(DX,DY)

ZM : calculated intensity at the point(DX,DY) by means of response

function

4-3. Format of disk??.fnc file

An example for disk??.map file is as follows.

2 2003 5 28 12.243 0.000 -0.003 -81.90 0.9632 2.301E-04 7.319E-02 \*

0.00 1.000E+00

0.02 1.000E+00

0.04 1.000E+00

0.06 1.000E+00

0.08 9.999E-01

: :

2.42 4.633E-05

2.44 4.635E-05

2.46 4.637E-05

2.48 4.638E-05

2.50 4.640E-05

A header(the 1st record) is a record of a table of disk??.out files

that correspons to this output.

After header data of response function is given.

In order from the left

RRR: integrating distance in degree from the solar disk center

ZZZ: normalized intensity at distance RRR (response function)

The response function ZZZ is determined from all RM and AM data

of the 'disk??.map' file.

4-4. Format of disk??.lst file

An example for disk??.lst file is as follows.

1 03/05/27,23:07:01,03/05/28,08:07:01,V,Akiruno,TS\_POM01.obs

2 03/05/28,03:14:34,03/05/28,12:14:34,V,Akiruno,TS\_POM01.obs

3 03/05/28,04:22:57,03/05/28,13:22:57,V,Akiruno,TS\_POM01.obs

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This is a table of measurement headers. The contents of header

are date and time (GMT and/or LT) and comments.

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