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Skyrad.pack\_V5.0/tkrnl: - 8/8 -

- Making of a Mie-kernel file -

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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 tkrnl/ there are the following three files for

'tkrnl' processing and this document 'ReadMe\_tkrnl.doc'.

. tkrnl2 : the main part of source program file 'tkrnl2.f'

. tkrnl2.f : full source program file for making of a Mie-kernel file

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

3. Procedure for 'tkrnl' processing

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3-1. Setting of 'tkrnl.par'

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

"MIEKER" : output kernel file name (fixed)

0 9 : IJOB NUMBER OF KNOT ANGLES

0.0 1.0 5.0 11.0 15.0 20.0 90.0 170.0 180.0 : KNOT ANGLES

5 8 6 2 2 14 16 2 : SUBINTERVAL NUMBER

1 2 : IJOB NUMBER OF KNOT SIZES

0.05 600.0 : KNOT SIZE PARAMETERS

59 : SUBDIVISION NUMBER FOR EACH SIZE INTERVAL

1 : POLARIZATION STATE (0, 1, 2, 4)

10 : NUMBER OF AVERAGING OVER SUBINTERVAL

C --- complex refractive indices setting.

13 0 0.00 0.00 : NCR FGR( 0:free) CRDMY1 CRDMY2

1.35 1.375 1.40 1.425 1.45 1.475 1.50 1.525 1.55 1.575 1.60 1.625 1.65 : CR

9 0 0.00 0.00 : NCI FGI( 0:free) CIDMY1 CIDMY2

0.0 0.001 0.002 0.003 0.005 0.01 0.02 0.03 0.05 : CI

The name of output kernel file 'MIEKER' must not be changed.

IJOB is a flag for division on linear or log axis. The range is divided

by equal spacing on linear axis, if IJOB=0 or on log axis, if IJOB=1.

Regarding scattering angles, IJOB, NUMBER OF KNOT ANGLES, KNOT ANGLES

and SUBINTERVAL NUMBER are set. A range between adjoining knot angles

is divided into SUBINTERVAL NUMBER on axis corresponding to IJOB.

Regarding size parameter of a Mie particle, IJOB, NUMBER OF KNOT SIZES

KNOT SIZE PARAMETERS and SUBDIVISION NUMBER FOR EACH SIZE INTERVAL are

set. A range between adjoining knot size parameters is divided into

SUBDIVISION NUMBER on axis corresponding to IJOB.

POLARIZAION STATE is 1 for skyrad analyses by this package.

NUMBER OF AVERAGING OVER SUBINTERVAL is used to suppress fluctuation.

Regarding complex refractive index of a Mie particle,

NCR,NCI : number of real and imaginary parts

FGR,FGI : flag for division of real and imaginary axes

= 1 : by equal spacing on linear axis

=-1 : by equal spacing on log axis

= 0 : free division (not equal spacing)

CR(I),CI(I): absolute values of real and imaginary parts

In case of free division, all values are set after two dummy data.

In other cases the 1st and the last values are set.

\* If FGI=-1, the 2nd and the last values are set. In this case

the 1st value is set as CI(1)=0.0.

Examples for setting of complex refractive index are given in the

margin of 'tkrnl.par' file.

3-2. Inputs

There is no input files for 'tkrnl' processing.

3-3. 'tkrnl' processing

(1) Run 'tkrnl2.e'

An executable file 'tkrnl2.e' for the source file 'tkrnl2.f' is

executed.

tkrnl2.e

3-4. Outputs

Output file 'MIEKER' is made.

\* The 'MIEKER' in this package is an output for the 'tkrnl.par'

setting of this package.

4. Formats of output files

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4-1. Format of 'MIEKER' file

The program code for writing is as follows.

Regarding a header part:

WRITE(IUO,10) IFORM ... IFORM=2

WRITE(IUO,11) NCR,NCI ... numbers of real and imaginary parts

WRITE(IUO,12) (VCR(I),I=1,NCR) ... data for real part

WRITE(IUO,13) (VCI(I),I=1,NCI) ... data for imaginary part

WRITE(IUO,20) INTVL,NANG,IPOL ... numbers of size parameters and

scattering angles, IPOL=1

WRITE(IUO,30) (SQRT(XX(I)\*XX(I+1)),I=1,INTVL) ... data of size parameters

WRITE(IUO,30) (THETA(I),I=1,NANG) ... data of scattering angles

Regarding data for a combination of real and imaginary parts:

WRITE(IUO,40) IREF ... No. of combination

WRITE(IUO,50) CRD,CID ... real and imaginary parts

DO I=1,INTVL

DO K=1,IPOL ... angular distributions

WRITE(IUO,30) (Q(J,K,I),J=1,NANG) of efficiency factors

ENDDO for scattering

ENDDO

DO K=1,2 ... efficienfy factors

WRITE(IUO,30) (Q(NANG+1,K,I),I=1,INTVL) for extinction (K=1)

ENDDO for absorption (K=2)

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