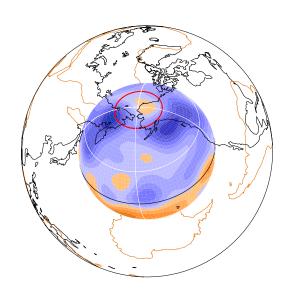
# **LEOPACK**



# cicm2ocdisplay

Conducting Inner Core and Mantle 2 Outer Core  ${\bf DISPLAY}$ 

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## 1 cicm2ocdisplay

Conducting Inner Core and Mantle 2 Outer Core DISPLAY

With the existing LEOPACK graphics programs, it is not possible to plot a constant radius diagram of a magnetic field function on the same plot as a velocity field when the magnetic field and velocity/temperature functions are stored in different files. For example, you could not plot contours of  $B_r$  on the same plot of arrows of horizontal flow. cicm2ocdisplay simply makes a temporary file containing velocity, temperature and magnetic field in the same vector files.

It is possible to add an inhomogeneous temperature function. This is done by setting SCAL in the input file to the strength of the temperature function applied. If SCAL is set to zero, the program does not attempt to read such inhomogeneous temperature files.

The stand-alone source code version of the program is compiled by typing

```
make sacicm2ocdisplay
```

Once the executable is created, begin execution by typing

```
cicm2ocdisplay < inputfile</pre>
```

The inputs file must have the following format.

```
* Input file for cicm2ocdisplay
junkfiles
                                : Stem for output filenames
                                : Name of velocity/temperature harms file
full_dynamo.intsv
full_dynamo.vecsv
                                : Name of velocity/temperature vector file
                                : Name of velocity/temperature xarr file
full_dynamo.xarrv
full_dynamo.intsm
                                : Name of magnetic field harms file
full_dynamo.vecsm
                                : Name of magnetic field vector file
full_dynamo.xarrm
                                : Name of magnetic field xarr file
 -0.1
                                 SCAL (Strength of boundary heating)
                                : Name of inhomog. temperature harms file
y22_boundary.ints
y22_boundary.vecs
                                : Name of inhomog. temperature vector file
y22_boundary.xarr
                                : Name of inhomog. temperature xarr file
```

Any line in the input file beginning with an asterisk, \*, is ignored by the program and can thus be used to enter comments and notes.

The arguments are as follows

- filename stem: First characters in output files to be generated by current run. Running cicm2ocdisplay with the above file will generate the files junkfiles.ints, junkfiles.vecs and junkfiles.xarr.
- ints file velocity: name of already existing indices file describing initial velocity and temperature functions.
- vecs file velocity: name of already existing vector file describing initial velocity and temperature functions. Must contain the same number of radial functions as indicated in the .intsv file.
- xarr file velocity: name of already existing radial spacings file describing initial velocity and temperature functions. Must contain the same number of radial grid nodes as indicated in the .vecsv file.
- ints file magnetic field: name of already existing indices file describing initial magnetic field functions.
- vecs file magnetic field: name of already existing vector file describing initial magnetic field. Must contain the same number of radial functions as indicated in the .intsm file.
- xarr file magnetic field: name of already existing radial spacings file describing initial magnetic field. Must contain the same number of radial grid nodes as indicated in the .vecsm file. See note above on compatibility of vecsv and vecsm files.
- SCAL: Multiplier for the inhomogeneous velocity term.
- ints file inhomogeneous temperature: name of already existing indices file describing the imposed temperature functions. NOT READ IF SCAL IS SET TO ZERO.
- vecs file inhomogeneous temperature: name of already existing vector file describing the imposed temperature functions. Must contain the same number of radial functions as indicated in the .intsv file. NOT READ IF SCAL IS SET TO ZERO.
- xarr file inhomogeneous temperature: name of already existing radial spacings file describing the imposed temperature functions. Must contain the same number of radial grid nodes as indicated in the .vecsv file. NOT READ IF SCAL IS SET TO ZERO.

Note that the output files have the 'no boundary conditions' option set and so they cannot be used for further calculations. They are only useful for display. As this program is very basic, I will not give any examples or further information.

### 1.1 Subprograms required for cicm2ocdisplay

#### SUBS subroutines

```
xarrc2.f xarrrd.f bihfrd.f svfrd.f xarrwt.f hmfwt.f
svfwt.f svrint.f fopen.f fclose.f gfdcfd.f fnamer.f
matop.f
```

SUBS integer function

indfun.f

**BLAS** integer function

idamax.f

**BLAS** subroutines

```
dgemv.f dgemm.f dtrsm.f dswap.f dger.f dscal.f
dtrmm.f dtrmv.f
```

### LAPACK subroutines

```
xerbla.f dgetrf.f dgetri.f dgetf2.f dlaswp.f dtrtri.f
dtrti2.f
```

LAPACK integer function

ilaenv.f

LAPACK logical function

lsame.f