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Introduction to running TASK

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1. Basic operation
2. How to setting parameters
3. Operation of equilibrium module: TASK/EQ
4. Operation of transport module: TASK/TR
5. Coupled operation of TASK/EQ and TASK/TR

Basic operation

- **Setup of graphic library GSAF**
  - **At the beginning of TASK codes, setup of GSAF is required.**
    - **Select graphic resolution** (0: metafile only, no graphics, n:)
    - **Input one character command**
      - c: continue
      - f: set metafile name (e.g. xxx.gs) and start saving
- **Choice of graphic operation**
  - **At the end of one page drawing, choose one char. command**
    - **c** or **CR**: change focus to original window and continue
    - **f**: set metafile name and start saving
    - **s**: start saving and save this page
    - **y**: save this page and continue
    - **n**: continue without saving
    - **d**: dump this page as a bitmap file “gsdump*n*”
    - **q**: quit program after confirmation

Graphic Utilities

- **Utility program**
  - **gsview**: View metafile
  - **gsprint**: Print metafile on a postscript printer
  - **gstoeps**: Convert metafile to eps files of each page
  - **gstops**: Convert metafile to a postscript file of all pages
- **Options**
  - **-a**: output all pages, otherwise interactive mode
  - **-s ps**: output from page ps
  - **-e pe**: output until page pe
  - **-p *np***: output contiguous *np* pages on a sheet
  - **-b**: output without title
- **Example**
  - **gstops -ab xxx.gs**: convert all figures to one postscript file
  - **gstoeps -ab xxx.gs**: convert each figure to a eps file

Typical File Name of TASK

- `XXcomm.f90`: Definition of global variables, allocation of arrays
- `XXmain.f90`: Main program for standalone use, read XXparm file
- `XXmenu.f90`: Command input
- `XXinit.f90`: Default values
- `XXparm.f90`: Read input parameters
- `XXview.f90`: Show input parameters
- `XXprep.f90`: Initialization of run, initial profile
- `XXexec.f90`: Execution of run
- `XXgout.f90`: Graphic output
- `XXfout.f90`: Text file output
- `XXsave.f90`: Binary file output
- `XXload.f90`: Binary file input

Typical input command

- When input line includes `=`, interpreted as a namelist input (e.g., `rr=6.5`)
- When the first character is not an alphabet, interpreted as a one-character command
  - `r`: Initialize profiles and execute
  - `c`: Continue run
  - `p`: Namelist input of input parameters
  - `v`: Display of input parameters
  - `g`: Graphic output
  - `w`: print output
  - `s`: Save results into a file
  - `l`: Load results from a file
  - `q`: End of the program

How to setting input parameters

- **Default setting of the module**
  - Default parameters are set at the subroutine `XX_init` in `XXinit.f90`
- **Preset parameter file**
  - If there is a namelist file `XXparm` in the executing directory, the module reads the file after the default parameter setting in `XX_init`.
  - Be careful not to leave an unnecessary file `XXparm` for avoiding unintentional set of parameters.
- **Setup of parameters by input lines**
  - You can set parameters by an input line of the namelist form

    ```
    name1=value1, name2=value2, name3=value3
    ```

  - You can set a list of parameters by the input lines after the one char. command “p” in the form of namelist file

    ```
    &XX
    name1=value1, name2=value2, name3=value3    (more lines)
    /
    ```

How to run TASK/EQ (1)

- **Interactive operation with default parameters**
  - `cd task/eq`
  - If there is a file named `eqparm` in this directory, remove or rename it
  - On macOS, start the module from a xterm window, not from a terminal window.
  - Key input sequence

    `./eq` start eq module)
    `5` (window size 1024x760)
    `c` (continue operation)
    `r` (run the module with default setting)
    `g` (start eq graphic interface)
    `s2` (2D standard plot)
    `CR,CR,CR,CR` (repeat Carriage Return 4 times)
    `x` (exit eq graphic interface)
    `q` (quit eq module)

How to run TASK/EQ (2)

- **Interactive operation with a preset file**
  - `cd task/eq`
  - `cp parm/eqparm.ITER eqparm`
  - On macOS, start the module from a xterm window, not from a terminal window.
  - Key input sequence

    `./eq` start eq module)
    `5` (window size 1024x760)
    `c` (continue operation)
    `r` (run the module with default setting)
    `g` (start eq graphic interface)
    `s` (1d and 2D standard plot)
    `CR`×10 (repeat Carriage Return 10 times)
    `x` (exit eq graphic interface)
    `q` (quit eq module)

- `rm eqparm` (remove eqparm file)

How to run TASK/EQ (3)

- **Batch operation with an input file**
  - `cd task/eq`
  - Start the module which reads an existing input file (`in/eq.ITER01.in`), writes an output file (`eq.ITER01.out`), and generates a graphic metafile (`eq.ITER01.gs`)

    ```
    ./eq <in/eq.ITER01.in >eq.ITER01.out
    ```
  - View the graphic output
    On macOS, start from a xterm window, not from a terminal window.

    ```
    gsview eq.ITER01.gs
    ```

    Enter figure page number or 0 for all
  - Convert the graphic metafile to a postscript file

    ```
    gstops -ab eq.ITER01.gs >eq.ITER01.ps
    ```
  - Convert all the figures in the graphic metafile to EPS files

    ```
    gstoeps -ab eq.ITER01.gs
    ```

How to run TASK/TR (1)

- **Interactive operation with default parameters**
  - Example of key input sequence

```
cd task/tr
./tr2        (start tr module: tr may conflict with a unix command)
5        (window size 1024x760)
c        (continue operation)
r        (start a run with default setting)
g        (start tr graphic interface)
t6        (time evolution) CR for next graphic input
r1        (radial profile)
x        (exit tr graphic interface)
c        (continue the run)
g        (start tr graphic interface)
t6        (time evolution)
r1        (radial profile)
x        (exit tr graphic interface)
q        (quit eq module)
```

How to run TASK/TR (2)

- **Interactive operation with a preset file**
  - `cd task/eq`
  - `cp parm/trparm.ITER trparm`
  - `./tr2` start tr module)
    `5` (window size 1024x760)
    `c` (continue operation)
    `r` (run the module with default setting)
    `ntmax=1000 nbtot=25` (change parameters)
    `c` (continue run)
    `g` (start eq graphic interface at 6 s)
    `t6` (time evolution, CR for next input)
    `r1` (radial profile)
    `x` (exit eq graphic interface)
    `q` (quit eq module)
  - `rm trparm` (remove trparm file)

How to run TASK/EQ (3)

- **Batch operation with an input file**
  - Input file: `in/tr.ITER01.in`
  - This example uses a fixed-boundary equilibrium file `../eq/eqdata.ITER01` in a previous eq run
  - `cd task/eq`
  - `./tr2 <in/tr.ITER01.in | tee tr.ITER01.out`
  - `gsview tr.ITER01.gs`