Fugaku Commercial Software
EXAPARTICLES/FLOW
(Former name : COLMINA CAE Particle-based Casting Simulator)
User's Guide

March, 2025

Version	Revision	Date
1.0		2023/09/01
1.1	Changed the name of software	2025/03/14

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1. Preface

Purpose of this document

This document describes how to use EXAPARTICLES/FLOW, which is maintained by the RIKEN Center for Computational Science (R-CCS) on the supercomputer "Fugaku".

- For general information on how to use Fugaku, please refer to the manuals in the Fugaku Portal
- Please refer to the EXAPARTICLES/FLOW manual for general EXAPARTICLES/FLOW usage

Prerequisite

The user shall have executed procedures such as the conclusion of a license agreement for EXAPARTICLES/FLOW in accordance with the "Flow to Start Using" and shall have received a notice of completion for the software usage environment.

This also applies when a user tries to use EXAPARTICLES/FLOW in accordance with the "Flow to Start Trial Use".

When using commercial software installed on Fugaku, R-CCS and cooperating organizations cooperate with software vendors to manage software licenses (operation checks) and conduct investigations when inquiring about software operation. Therefore, license information and inquiries may be shared among R-CCS, cooperating organizations, and software vendors. Please understand this in advance.

２．Executing EXAPARTICLES/FLOW

   The following is an example of a job script. Please modify it as appropriate for your work environment. Refer to the description below for the red parts. This job is submitted to the computation node.

Table 1 Sample Script

```
#!/bin/sh
#PJM -L "rscgrp=small"
#PJM -L "node=1"
#PJM -L "eco_state=2"
#PJM -L "elapse=00:30:00"
#PJM --mpi "proc=4"
#PJM -S
#PJM -g <groupname>
#PJM -x PJM_LLIO_GFSCACHE=/vol0004

module use /vol0004/apps/isv/EXAPARTICLES/modulefiles
module load EXAPARTICLES

export FJSPH_LICENSE_FILENAME=Full_path_to_license_file

export OMP_NUM_THREADS=12

/home/system/tool/dir_transfer ${EXAPARTICLES_PATH}
mpiexec sph
/home/system/tool/dir_transfer -p ${EXAPARTICLES_PATH}
```

２.１.Settings for EXAPARTICLES/FLOW

● #PJM -L "eco_state=2"

   This option specifies the execution mode of Fugaku. In the example above, the boost eco mode is specified. Whether or not the execution mode setting has an effect on execution performance, and how large the effect is, depends on the input data. Please select the mode which makes acceptable performance degradation and as large power reduction as possible. For more detail, please refer to:
   https://www.fugaku.r-ccs.riken.jp/en/operation/20220701_01

● #PJM -x PJM_LLIO_GFSCACHE=/vol0004

When submitting jobs, be sure to specify /vol0004 in the environment variable PJM_LLIO_GFSCACHE.

- module command
    Used to set environment variables.

- module use
    Specifies where *modulefile* is stored. Do not change.

- module load *modulefile*
    Sets environment variables defined in *modulefile*.

module load EXAPARTICLES

    is specified, the latest version installed on Fugaku is used.

    Important: Environment variables set by the module load command may include runtime parameters. When specifying runtime parameters, be sure to specify them after the module load command.

    To use a specific version, change the *modulefile*.

Example: Using V1_2308 version
module load EXAPARTICLES/V1_2308

- ➤ module avail
    Displays a list of available *modulefiles*.

module use /vol0004/apps/isv/EXAPARTICLES/modulefiles
module avail EXAPARTICLES

- ➤ module show *modulefile*
    Displays what is set by the module command.

Example: Show what is set when EXAPARTICLES is specified
module use /vol0004/apps/isv/EXAPARTICLES/modulefiles
module show EXAPARTICLES

- FJSPH_LICENSE_FILENAME
    Specify the full path to the location of the license file received from the licenser or Fugaku Support. Save the license file in a directory that can be accessed by the computation nodes.

3. Change in the environment of EXAPARTICLES/FLOW

When environmental changes are made to EXAPARTICLES/FLOW, the details and date of the changes will be posted on the Fugaku Portal. Please check the details of the changes and take action if necessary. The following is a list of expected changes, their impact on users, and how to deal with them.

- **EXAPARTICLES/FLOW Version Upgrade**
  If you use the latest version specified with EXAPARTICLES in module load, the software version executed after the change date will be changed to the newly latest version. If you want to keep using the currently using version, add the product version to the module load specification.

- **EXAPARTICLES/FLOW specific version removal**
  If the version to be deleted is specified in module load, the software will not be available after the change date. Please change the module load settings to switch to another available version.

4. Support

Please contact the Fugaku support (https://fugaku.zendesk.com/hc/en-us) for Fugaku-specific content. For general information about EXAPARTICLES/FLOW, please contact your licensee.

4.1. Support (Trial use)

For trial use, contact the Fugaku support site (https://fugaku.zendesk.com/hc/en-us) regardless of the query content. When contacting us, please indicate in the query body that this is a trial use.
Please note that there are the following precautions for handling inquiries.
- Inquiries about the operation of commercial applications will be accepted only during the trial period.
- queries are answered sequentially, but the answer may be after the end of the trial utilization period.