

# Domain\_Features

This data setup defines the domain size, the grid data, the domain decomposition features (MPI parallelisation characteristics : number of MPI processes bounded to subdomains and how they are distributed over the domain) and the number of threads also used to split the domain (OpenMP parallelisation).

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## Geometric\_Layout

- Type : integer value
- This option selects the type of geometry configuration used :
  - 0 : Cartesian geometry
  - 1: Cylindrical geometry. The axis is oriented along the K-direction. The coordinate system is  $r(i), \theta(j), z(k)$
  - 2: Cylindrical geometry. The axis is oriented along the I-direction. The coordinate system is  $r(j), \theta(k), z(i)$
  - 3: Cylindrical geometry. The axis is oriented along the J-direction. The coordinate system is  $r(k), \theta(i), z(j)$

## Start\_Coordinate\_I\_Direction

- Type : real value
- origin coordinate along the I-direction.

## Start\_Coordinate\_J\_Direction

- Type : real value
- origin coordinate along the J-direction.

## Start\_Coordinate\_K\_Direction

- Type : real value
- origin coordinate along the K-direction.

## End\_Coordinate\_I\_Direction

- Type : real value
- End coordinate along the I-direction.

## End\_Coordinate\_J\_Direction

- Type : real value
- End coordinate along the J-direction.

## End\_Coordinate\_K\_Direction

- Type : real value
- End coordinate along the K-direction.

```
Cells_Number_I_Direction= integer value (Number of cells along  
the I-direction, excluding the ghost-cells)  
Cells_Number_J_Direction= integer value (Number of cells along  
the J-direction, excluding the ghost-cells)  
Cells_Number_K_Direction= integer value (Number of cells along  
the K-direction, excluding the ghost-cells)
```

```
OpenMP)      Number_OMP_Threads= integer value (Number of Threads for  
  
MPI_Cartesian_Topology= true (MPI cartesian topolgy) or false  
MPI_Graphic_Topology= true (MPI graphic topology) or false  
Total_Number_MPI_Processes = integer value (number of MPI  
processes)  
Max_Number_MPI_Proc_I_Direction= integer value (maximum number  
of MPI processes along the I-direction)  
Max_Number_MPI_Proc_J_Direction= integer value (maximum number  
of MPI processes along the J-direction)  
Max_Number_MPI_Proc_K_Direction= integer value (maximum number  
of MPI processes along the K-direction)
```

```
Regular_Mesh= true or false (in this case, the meshgrid must be  
built with the sotfware meshgen)
```

From:  
<https://sunfluidh.lisn.upsaclay.fr/> - Documentation du code de simulation numérique SUNFLUIDH

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Last update: 2016/10/08 18:26

