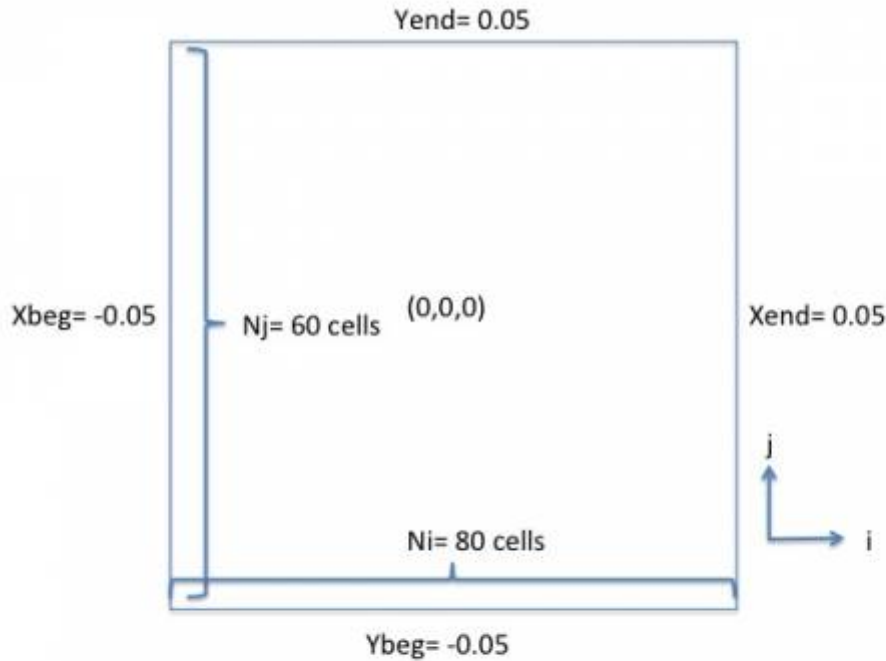


Domain_Features

This data set defines the domain size, the grid data, the domain decomposition features (MPI parallelisation characteristics : number of MPI processes connected to subdomains and how they are distributed over the domain) and the number of threads also used to split the domain (OpenMP parallelization). **The data related to the parallelization (MPI and OpenMP) are not available for the release SUNFLUIDH_EDU.**

Full data set of the namelist

```
&Domain_Features Geometric_Layout           = 0,
                  Start_Coordinate_I_Direction = -0.05 ,
                  End_Coordinate_I_Direction   = 0.05,
                  Start_Coordinate_J_Direction = -0.05 ,
                  End_Coordinate_J_Direction   = 0.05,
                  Start_Coordinate_K_Direction = 0.00 ,
                  End_Coordinate_K_Direction   = 0.00,
                  Cells_Number_I_Direction     = 80 ,
                  Cells_Number_J_Direction     = 60 ,
                  Cells_Number_K_Direction     = 1,
                  Number_OMP_Threads           = 1,
                  MPI_Cartesian_Topology        = .false. ,
                  MPI_Graphic_Topology         = .false. ,
                  Total_Number_MPI_Processes    = 1,
                  Max_Number_MPI_Proc_I_Direction= 1 ,
                  Max_Number_MPI_Proc_J_Direction= 1,
                  Max_Number_MPI_Proc_K_Direction= 1,
                  Regular_Mesh                 = .true. /
```



In domain decomposition approach (MPI parallelization), the number of cells (Cells_Number_I_Direction, Cells_Number_J_Direction, Cells_Number_K_Direction) is related to each subdomain , not the whole domain. Find some examples [here](#) .

Definition of the data set

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 $r(k), \theta(i), z(j)$
 - Default value = 0

Start_Coordinate_I_Direction

- Type : real value
- Origin coordinate along the I-direction.
- Default value must be set by the user

Start_Coordinate_J_Direction

- Type : real value
- Origin coordinate along the J-direction.
- Default value must be set by the user

Start_Coordinate_K_Direction

- Type : real value
- Origin coordinate along the K-direction.
- Default value must be set by the user

End_Coordinate_I_Direction

- Type : real value
- End coordinate along the I-direction.
- Default value must be set by the user

End_Coordinate_J_Direction

- Type : real value
- End coordinate along the J-direction.
- Default value must be set by the user

End_Coordinate_K_Direction

- Type : real value
- End coordinate along the K-direction.
- Default value must be set by the user

Cells_Number_I_Direction

- Type : integer value
- Number of cells along the I-direction (excluding the ghost-cells).
In decomposition domain approach (MPI parallelization), the number of cells is related to each subdomain , not the whole domain.
- Default value= 0

Cells_Number_J_Direction

- Type : integer value
- Number of cells along the J-direction (excluding the ghost-cells).
In decomposition domain approach (MPI parallelization), the number of cells is related to each subdomain , not the whole domain.
- Default value= 0

Cells_Number_K_Direction

- Type : integer value
- Number of cells along the K-direction (excluding the ghost-cells)
In decomposition domain approach (MPI parallelization), the number of cells is related to each subdomain , not the whole domain.
- Default value= 0

Number_OMP_Threads

- integer value (**Not for the release SUNFLUIDH_EDU**).
- Number of Threads for OpenMP parallelization
- Default value= 1

MPI_Cartesian_Topology

- Type : Boolean value (**Not for the release SUNFLUIDH_EDU**).
- Select the MPI cartesian topology for the domain decomposition method (same number of subdomains along a given direction)
- Default value= .false.

MPI_Graphic_Topology

- Type : Boolean value (**Not for the release SUNFLUIDH_EDU**).
- Select the MPI graphic topology for the domain decomposition method (the number of subdomain along a given direction is variable)
- Default value= .false.

Total_Number_MPI_Processes

- Type : integer value (**Not for the release SUNFLUIDH_EDU**).
- Total number of MPI processes used in the domain decomposition method
- Default value= 1

Max_Number_MPI_Proc_I_Direction

- Type : integer value (**Not for the release SUNFLUIDH_EDU**).
- Number of MPI processes along the I-direction (maximum number for the graphic topology)
- Default value= 1

Max_Number_MPI_Proc_J_Direction

- Type : integer value (**Not for the release SUNFLUIDH_EDU**).
- Number of MPI processes along the J-direction (maximum number for the graphic topology)
- Default value= 1

Max_Number_MPI_Proc_K_Direction

- Type : integer value (**Not for the release SUNFLUIDH_EDU**).
- Number of MPI processes along the K-direction (maximum number for the graphic topology)
- Default value= 1

Regular_Mesh

- Type : boolean value
- if .true., the mesh size is regular along each direction and the grid is directly built by the code.
- If .false., the grid is irregular and the cell distribution is read in the specific files maillx_XXXXX.d, mailly_XXXXX.d and maillz_XXXXX.d (XXXXX corresponds to the subdomain/MPI-process number if the MPI domain-decomposition is used). These files are created from the mesh builder named meshgen.x.
- Default value= .true.

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

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https://sunfluidh.lisn.upsaclay.fr/doku.php?id=sunfluidh:domain_features_namelist&rev=1544797340

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