

## Namelist "Polyhedral\_Immersed\_Bodies"

This data setup is used to build the polyhedral solid bodies that contribute to the geometrical configuration. The form and the position of each polyhedron are defined by means of its corners (4 in 2D and 8 in 3D).

Each corner is located by a couple of coordinate  $\{X_i_n, X_j_n\}$  in 2D or a triplet of coordinate  $\{X_i_n, X_j_n, X_k_n\}$  in 3D, where the index  $n$  is the corner number.

Each corner is numbered as following :

- from  $n=1$  to  $n=4$ , the group of corners forms a quadrangle that is the floor of the polyhedron in 3D (or directly the solid body in 2D). The corner's number must be ranked in the counterclockwise direction and the corner  $n=1$  must be the one with the lowest values.
- from  $n=5$  to  $n=8$ , the group of corners forms a quadrangle that is the ceiling of the polyhedron. The rules applied to sort the corners are the same as previously. This group can be omitted in 2D configuration.

## Full data set of the namelist

```
&Polyhedral_Immersed_Bodies
```

```

      Xi_1= 0.0   , Xj_1= 0.0   ,Xk_1= 0.0   ,
      Xi_2= 0.0   , Xj_2= 0.0   ,Xk_2= 0.0   ,
      Xi_3= 0.0   , Xj_3= 0.0   ,Xk_3= 0.0   ,
      Xi_4= 0.0   , Xj_4= 0.0   ,Xk_4= 0.0   ,
      Xi_5= 0.0   , Xj_5= 0.0   ,Xk_5= 0.0   ,
      Xi_6= 0.0   , Xj_6= 0.0   ,Xk_6= 0.0   ,
      Xi_7= 0.0   , Xj_7= 0.0   ,Xk_7= 0.0   ,
      Xi_8= 0.0   , Xj_8= 0.0   ,Xk_8= 0.0   ,
      Identifier_Value= 1,
      End_of_Data_Block= .true. /

```



Don't forget to set the boolean data "End\_of\_Data\_Block" at the end of the namelist. A ".true." value means the end of the data block when several namelists are used to create several polyhedrons.

Find [here](#) how to construct the wall boundary conditions and some examples about that.

## Definition of the data set

## **Xi\_1, Xj\_1, Xk\_1**

- Type : real value
- Coordinates of the 1st corner (that belongs to the floor of the polyhedron). For 2D configurations, only the couple {Xi\_1, Xj\_1} could be considered. This coordinate set must get the lowest values of the floor group.
- Default value= none

## **Xi\_2, Xj\_2, Xk\_2**

- Type : real value
- Coordinates of the 2nd corner (that belongs to the floor of the polyhedron).
- Default value= none

## **Xi\_3, Xj\_3, Xk\_3**

- Type : real value
- Coordinates of the 3rd corner (that belongs to the floor of the polyhedron).
- Default value= none

## **Xi\_4, Xj\_4, Xk\_4**

- Type : real value
- Coordinates of the 4th corner(that belongs to the floor of the polyhedron).
- Default value= none

## **Xi\_5, Xj\_5, Xk\_5**

- Type : real value
- Coordinates of the 5h corner (that belongs to the ceiling of the polyhedron). This coordinate set must get the lowest values of the ceiling group.
- Default value= none

## **Xi\_6, Xj\_6, Xk\_6**

- Type : real value
- Coordinates of the 6th corner (that belongs to the ceiling of the polyhedron).
- Default value= none

## **Xi\_7, Xj\_7, Xk\_7**

- Type : real value
- Coordinates of the 7th corner.
- Default value= none

## Xi\_8, Xj\_8, Xk\_8

- Type : real value
- Coordinates of the 8th corner.
- Default value= none

## Identifier\_Value

- Type : integer value
- Identifier related to the rank number of the wall boundary condition setup that is applied to a polyhedral body. If Identifier\_Value=3, the polyhedral body is linked with the 3rd wall boundary condition setup written in the data file. A wall boundary condition setup pools the wall boundary conditions applied to the velocity components, heat and species. It can be built from the namelists "Velocity\_Wall\_Boundary\_Condition\_Setup", "Heat\_Wall\_Boundary\_Condition\_Setup" and "Species\_Wall\_Boundary\_Condition\_Setup" (Find [here](#) some examples about wall boundary conditions).
- Default value= none

## End\_of\_Data\_Block

- Type : boolean value
- Specify the end of the namelist or a group of this type of namelist (if true).

From:

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

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Last update: **2016/11/20 19:56**

