Namelist "Velocity_Wall_Boundary_Condition_Setup"

This data setup allow the user to handle the boundary conditions applied to the velocity components on walls. Walls are identified according to the orientation of their normal vector from the adjacent fluid-cell. They are named as :

- WEST : if the wall is located at the i-1 face-cell (in regard to a fluid-cell)
- EAST : if the wall is located at the i+1 face-cell.
- BACK : if the wall is located at the j-1 face-cell.
- FRONT : if the wall is located at the j+1 face-cell.
- SOUTH : if the wall is located at the k-1 face-cell.
- NORTH : if the wall is located at the k+1 face-cell.

Full data set of the namelist

```
&Velocity_Wall_Boundary_Condition_Setup
 West_Velocity_I_BC_Option = 0  , East_Velocity_I_BC_Option = 0 ,
 Back_Velocity_I_BC_Option = 0  , Front_Velocity_I_BC_Option= 0 ,
 South_Velocity_I_BC_Option= 0  , North_Velocity_I_BC_Option= 0 ,
 West_Velocity_J_BC_Option = 0  , East_Velocity_J_BC_Option= 0 ,
 Back_Velocity_J_BC_Option = 0  , Front_Velocity_J_BC_Option= 0 ,
 South_Velocity_J_BC_Option= 0  , North_Velocity_J_BC_Option= 0 ,
 West_Velocity_K_BC_Option= 0   , East_Velocity_K_BC_Option= 0 ,
 Back_Velocity_K_BC_Option= 0   , Front_Velocity_K_BC_Option= 0 ,
 South_Velocity_K_BC_Option= 0  , North_Velocity_K_BC_Option= 0 ,
 West_Velocity_I_Function_Type = 0, East_Velocity_I_Function_Type= 0,
 Back_Velocity_I_Function_Type = 0, Front_Velocity_I_Function_Type= 0,
 South_Velocity_I_Function_Type= 0, North_Velocity_I_Function_Type= 0 ,
 West_Velocity_J_Function_Type = 0, East_Velocity_J_Function_Type= 0,
 Back_Velocity_J_Function_Type = 0, Front_Velocity_J_Function_Type= 0,
 South_Velocity_J_Function_Type= 0, North_Velocity_J_Function_Type= 0 ,
 West_Velocity_K_Function_Type = 0, East_Velocity_K_Function_Type= 0,
 Back_Velocity_K_Function_Type = 0, Front_Velocity_K_Function_Type= 0,
 South_Velocity_K_Function_Type= 0, North_Velocity_K_Function_Type= 0 ,
 West_Wall_Velocity_I = 0.0   , East_Wall_Velocity_I= 0.0    ,
 Back_Wall_Velocity_I = 0.0   , Front_Wall_Velocity_I= 0.0     ,
 South_Wall_Velocity_I= 0.0   , North_Wall_Velocity_I= 0.0 ,
 West_Wall_Velocity_J= 0.0    , East_Wall_Velocity_J= 0.0    ,
 Back_Wall_Velocity_J= 0.0    , Front_Wall_Velocity_J= 0.0     ,
 South_Wall_Velocity_J= 0.0   , North_Wall_Velocity_J= 0.0 ,
 West_Wall_Velocity_K= 0.0    , East_Wall_Velocity_K= 0.0    ,
 Back_Wall_Velocity_K= 0.0    , Front_Wall_Velocity_K= 0.0     ,
 South_Wall_Velocity_K= 0.0   , North_Wall_Velocity_K= 0.0 ,
 End_of_Data_Block= .true.   /
```

> ⚠ The data bounded to the velocity components contain the character string "Velocity_I", "Velocity_J" or "Velocity_K". These data are thus applied to the velocity

component along the I,J or K-direction, respectively.

When the usual no-slip and impermeability conditions are applied for all walls, this namelist could be omitted in the data file. The code use this boundary condition by default.

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 define several type of boundary conditions.

This namelist can be pooled with other ones of same type (for the temperature or species mass fraction) to form a wall boundary condition setup.

Find here some examples about wall boundary conditions.

Definition of the data set

For a sake of clarity, the data are defined for the the "WEST" wall and for the I-velocity component only. The user can easily define the boundary conditions related to the other walls and other velocity components by substituting the relevant character strings in the name of variables.

WEST_Velocity_I_BC_Option

- Type : integer value
- Select the type of the boundary condition applied to the I-component and bounded to the WEST wall. The available options are :
  - 0 : Fixed value
  - 1 : Zero gradient
  - 2 : Symmetric plan
- Default value = 0

WEST_Velocity_I_Function_Type

- Type : integer value
- Definition of the distribution law over the wall face. The available options are :
  - 0 : Uniform distribution over the wall
  - greater than 0 : require an user's defined function in the module module_user_define_wall_bc.f90)
  - Default value = 0

West_Wall_Velocity_I

- Type : Real value
- Value of the velocity component when the boundary conditions are Dirichlet type.
- Default value = 0.0

End_of_Data_Block

- Type : boolean value
- Specify the end of the namelist or a group of this type of namelist used to define different types of velocity boundary conditions.