

## Namelist SGS\_Model

This data setup allows the user to use a LES subgrid model to modelize the subgrid scales effects of turbulence.

The different models are proposed here to take into account the dynamical scales and the thermal scales (when heat transfer is considered). Some LES models results from the research performed at LIMSI. Their use depends on the type of flow considered.

### LES\_Enabled

- Type : boolean value
- This data enables the LES models (if it is set to .true.)

### Type\_of\_kinematic\_Model

- Type : integer value
- This data allows the user to select the LES model related to the dynamic scales of the flow to define a subgrid viscosity term in the momentum equations.
  - 0 : Static model of Mansour (version 0 : like Smagorinsky model with the vorticity tensor considered in place of the constraint tensor)
  - 1 : Static model of Mansour (version 1)
  - 2 : Mixed scales model (Mansour + Bardina approach to estimate the subgrid scales)
  - 11 : Dynamic model based on the Germano procedure applied to the Mansour's model
  - 20 : Entropic viscosity model (Developed by J.L. Guermond in order to get a suitable solution "à la Leray")

### Type\_of\_Thermal\_Model

- Type : integer value
- This data allows the user to select the LES model related to the dynamic scales and/or the thermal scales of the flow to define a subgrid thermal conductivity term in the enthalpy equation.
  - 0 : No thermal LES model
  - 1 : Static model based on Mansour's model with a constant value of the subgrid Prandtl number
  - 2 : Static model based on functional approach similar to the Mansour's model for heat flux
  - 3 : Mixed scales model (Static + Bardina approach in order to estimate the subgrid scales of heat flux)
  - 10 : Dynamic model based on the Germano procedure applied to the static model (1) in order to estimate a local value of the subgrid Prandtl number
  - 11 : Dynamic model based on a Reynolds analogy in order to estimate a local value of the subgrid Prandtl number
  - 20 : Dynamic model based on the Germano procedure applied to the static model (2) in order to estimate a local value of the subgrid Prandtl number

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