

The precision of the pressure-velocity coupling can be set through the number of iterations `nterup` and through the relative precision `epsup` for the convergence test of the iterative process. The default values are set to `nterup=1` and `epsup=10-5`.

For time marching schemes, it is possible to under-relax the pressure increments calculated within the pressure correction step (by default, no relaxation is used: `relaxv(ipr)=1`). This is useful for distorted meshes and, *a priori*, it does not affect the quality of the solution. From *Code\_Saturne* user's manual<sup>[1]</sup>, 30% is a reasonable value for the under-relaxation parameter (i.e. `relaxv(ipr)=0.7`). For example, this option may be activated if the calculation fails after several time steps for which the number of iterations of the pressure iterative solver has been unusually large or if one suspects that the quality of the mesh is low in a region where large velocity values develop over a few time steps.

## A.6 Turbulence Models

*Code\_Saturne* has several turbulence models available that can be activated through the indicator `iturb`:

- 0: DNS (no model)
- 20: RANS  $k - \varepsilon$
- 21: RANS  $k - \varepsilon$  with linear production (Laurence and Guimet)
- 30: RANS  $R_{ij} - \varepsilon$  standard LRR (Launder, Reece and Rodi)
- 31: RANS  $R_{ij} - \varepsilon$  SSG (Speziale, Sarkar and Gatski)
- 32: RANS  $R_{ij} - \varepsilon$  EBRSM (elliptic blending)
- 40: LES Smagorinsky model
- 41: LES dynamic model
- 42: LES WALE
- 50: RANS v2-f,  $\varphi$ -model version
- 51: RANS v2-f, BL-v2/k version
- 60: RANS  $k - \omega$ , SST version
- 70: RANS Spart-Allmaras (SA)