The governing equations are:

$$\begin{aligned} \frac{\partial \rho}{\partial t} + \vec{\nabla}.(\rho \vec{u}) = 0 \\ \frac{\partial \vec{u}}{\partial t} + (\vec{u}.\vec{\nabla})\vec{u} = \frac{\mu}{\rho}(\nabla)^2 \vec{u} - (C_s)^2 \frac{\vec{\nabla}\rho}{\rho} \end{aligned} \tag{1}$$

ρ is the density and $\vec{u}$ determines the velocity of the 2D fluid. The mach number, $M = U_0/C_s$, U_0 is the velocity-scale or mean velocity, C_s is the sound speed of the fluid, μ/ρ is the kinematic viscosity. The neutral density, $\rho_0 = 1.0$. The relation between pressure (P) and density (ρ) is , $P = (C_s)^2 \rho$.

The code solves the Eq. 1 in two dimensional periodic boundaries with the help of finite-difference scheme.