

Solve Navier-Stokes equation

$$\left\{ \begin{array}{l} \frac{dee}{dt} = -u \frac{dee}{dx} - v \frac{dee}{dy} + \text{Re} \Delta (ee) \\ ee = \Delta (ps) \\ \frac{dps}{dy} = u, \frac{dps}{dx} = -v \end{array} \right.$$

with border conditions:

$$\begin{array}{ccc} \downarrow Oy & B3 & \rightarrow Ox \\ \text{input } B4 & & B6 \text{ output} \\ & B1 & \end{array}$$

B4 is steam input. It weak near edges (coasts) and strong near center so it use parabola equation for speed $V = (u(y), 0)$ where $u(y) = Cy(H - y)$. For ps used :

$$ps(y) = \int_0^y u(s) ds = \frac{CHy^2}{2} - \frac{CHy^3}{3} + \text{const}$$

B6 is same like B4

B1 and B3 we use $u = \frac{dps}{dy}, v = -\frac{dps}{dx} \Rightarrow ps = vx + c = c1x + c = u0x + c$ (u0 is const for init)

for ee in all borders Bi used deffinition of function of vorticity

$$ee = \frac{du}{dy} - \frac{dv}{dx}$$