ME 543

Project Report
On
Lid driven cavity

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❖ Governing equations

$$\frac{\partial^2\psi}{\partial x^2}+\frac{\partial^2\psi}{\partial y^2}=-\omega$$

$$u\frac{\partial\omega}{\partial x}+v\frac{\partial\omega}{\partial y}=\frac{1}{\mathrm{Re}}\left(\frac{\partial^2\omega}{\partial x^2}+\frac{\partial^2\omega}{\partial y^2}\right)$$

$$u=\frac{\partial\psi}{\partial y}\ ,\quad v=-\frac{\partial\psi}{\partial x}$$

❖ Comparative Plotting at Re=100 and Re400.

Re=100 Re=400

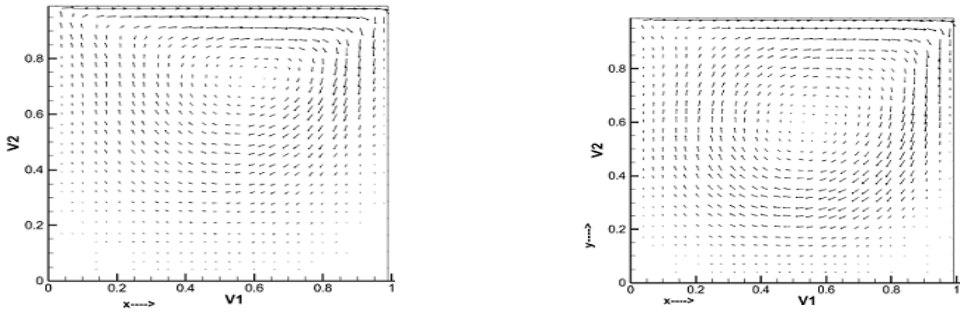

Fig: -Velocity vector Field

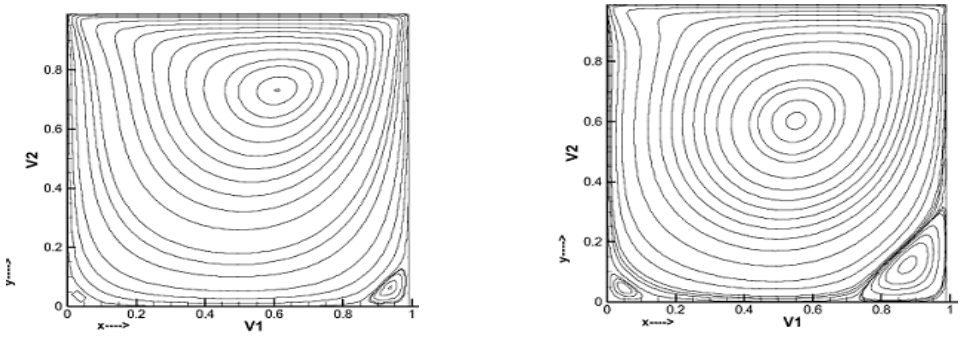

Fig: -Stream Lines

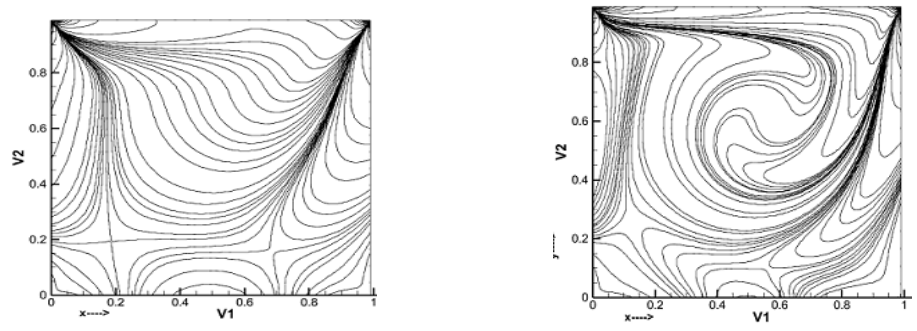

Fig: -Vorticity

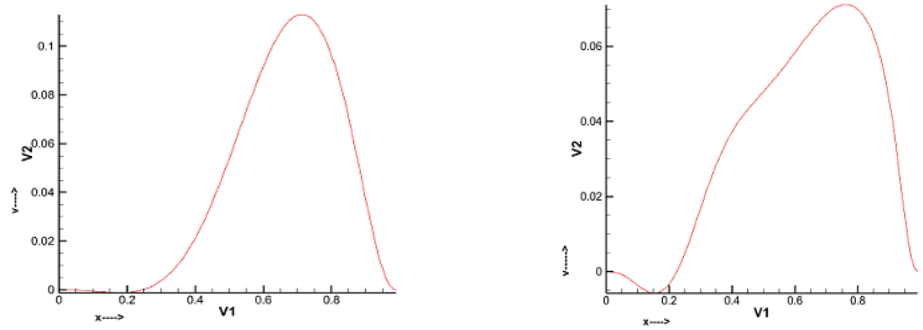

Fig: - velocity (at mid-point)

Re=100 Re=400

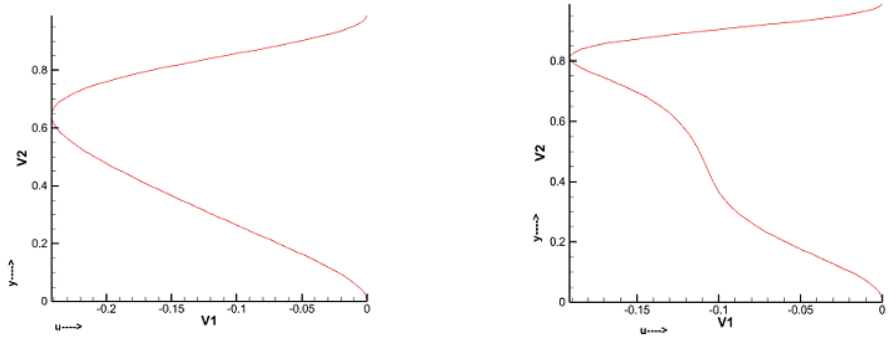

Fig: - U-velocity (at mid-point)