DESCRIPTION

BHS

$$Lid-driven_G ordon \;\; equation$$
$$u \cdot \nabla u + \nabla p - \frac{1}{Re}\Delta u = 0$$
$$x \in [0,1], y \in [0,1]$$
$$\nabla \cdot u = 0$$
$$u(x,y) = (1,0), \quad y = 1$$
$$u(x,y) = (0,0), \quad x = 0, x = 1, y = 0$$
$$Re = 100$$

$$\mathbf{u}(\mathbf{x},\mathbf{y}) = (u(x,y), v(x,y))$$
$$uu_x + uu_y + p_x - \frac{1}{Re}(u_{xx} + u_{yy}) = 0$$
$$uv_x + uv_y + p_y - \frac{1}{Re}(v_{xx} + v_{yy}) = 0$$
$$u_x + v_y = 0$$

References

[1] Wang S, Teng Y, Perdikaris P. Understanding and mitigating gradient flow pathologies in physics-informed neural networks[J]. SIAM Journal on Scientific Computing, 2021, 43(5): A3055-A3081.