DESCRIPTION

BHS

$$
\begin{gathered}
unsteady - stocks - 2D \\
V_t - \alpha \cdot \nabla^2 V + \nabla q = f, \quad in \quad \Omega_T \\
\nabla \cdot V = 0, \quad in \ \Omega_T \\
V|_{\partial\Omega} = 0, \quad on \quad \partial\Omega_T \\
V|_{t=0} = V_0, \quad on \quad \Omega
\end{gathered}
$$

$$
\begin{gathered}
\alpha = 0.025 \\
V = [u_1(t, x_1, x_2), u_2(t, x_1, x_2)] \\
x_1 \in [0, 1], x_2 \in [0, 1], t \in [0, 1] \\
u_1(t, x_1, x_2) = 2sin(t)sin(\pi x_1)^2 sin(\pi x_2)cos(\pi x_2)\pi \\
u_2(t, x_1, x_2) = -2sin(t)sin(\pi x_2)^2 sin(\pi x_1)cos(\pi x_1)\pi \\
p(t, x_1, x_2) = sin(t)cos(\pi x_1)cos(\pi x_2)
\end{gathered}
$$

References

[1] Jing Yue,Jian Li. The Physics Informed Neural Networks for the unsteady Stokes problems[J]. International Journal for Numerical Methods in Fluids.