DESCRIPTION

BHS

$$unsteady-stocks-3D$$
$$\mathbf{v}_t-\alpha\nabla^2\mathbf{v}+\nabla p=\mathbf{f},\quad in\quad \boldsymbol{\Omega}_T$$
$$\nabla\cdot\mathbf{v}=0,\quad in\ \boldsymbol{\Omega}_T$$
$$\mathbf{v}|_{\partial\Omega}=0,\quad on\quad \partial\boldsymbol{\Omega}_T$$
$$\mathbf{v}|_{t=0}=\mathbf{v}_0,\quad on\quad \boldsymbol{\Omega}$$

$$\alpha=0.025$$
$$\mathbf{v}=[u_1(t,x),u_2(t,x),u_3(t,x)]$$
$$x_1\in[0,1],x_2\in[0,1],x_3\in[0,1],t\in[0,1]$$
$$u_1(t,x)=sin(t)sin(\pi x_1)^2(sin(2\pi x_2)sin(\pi x_3)^2-sin(\pi x_2)^2sin(2\pi x_3))$$
$$u_2(t,x)=sin(t)sin(\pi x_2)^2(sin(2\pi x_3)sin(\pi x_1)^2-sin(\pi x_3)^2sin(2\pi x_1))$$
$$u_1(t,x)=sin(t)sin(\pi x_3)^2(sin(2\pi x_1)sin(\pi x_2)^2-sin(\pi x_1)^2sin(2\pi x_2))$$
$$p(t,x)=sin(t)sin(\pi x_1)sin(\pi x_2)cos(\pi x_3)$$

References

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