

Introduction Navier-Stokes Equations

We will study the system defined by the Navier-Stokes equations `eq:Incompressibility` and `eq:Momentum`.
`align` $\rho t + \vec{\nabla} \cdot (\rho \vec{u}) = 0$ `eq : Incompressibility`

Let us quickly describe and name each term of `eq:Momentum`. `description`

- [Local acceleration $\vec{u}t$] is simply the local acceleration of a fluid particle.
- [Advection term $(\vec{u} \cdot \vec{\nabla}) \vec{u}$] is the non linear term representing the acceleration due to the fluid itself.
- [Pressure gradient term $-1\rho\vec{\nabla}p$] represents the effects of the pressure on the fluid.
- [Gravitational term \vec{g}] is the force acting on the fluid due to gravity.
- [Coriolis term $2\vec{\Omega} \wedge \vec{v}$] is an apparent force arising from the rotation of our reference frame.
- [Viscous term $\nu\Delta\vec{u}$] is the diffusion of the momentum due to fluid viscosity.