Euler equation

@wikipedia

Momentum equation for Inviscid fluid flow (a partial case of Navier–Stokes equation):

(1) $$\frac{\partial \mathbf{u}}{\partial t} + (\mathbf{u} \cdot \nabla)\mathbf{u} = -\frac{1}{\rho}\nabla p + \mathbf{g} + \frac{1}{\rho} \cdot \mathbf{f}_{\text{cnt}}$$

where

$\mathbf{u}$	fluid velocity
ρ	fluid density
ν	fluid kinematic viscosity
$\mathbf{g}$	resulting specific body force exerted on fluid body
$\mathbf{f}_{\text{cnt}}$	volumetric density of all contact forces exerted on fluid body

Approximations

Transient 1D Inviscid fluid flow	(2) $\rho \left(\frac{\partial u}{\partial t} + u \frac{\partial u}{\partial l} \right) = -\frac{\partial p}{\partial l} + \rho g \cos\theta + f_{\text{cnt},\,l}$
Steady-state 1D inviscid fluid flow	(3) $\frac{dp}{dl} = -\rho u \frac{du}{dl} + \rho g \cos\theta + f_{\text{cnt},\,l}$
Bernoulli equation = Steady-state 1D inviscid fluid flow of incompressible fluid with no friction	(4) $\frac{p(l)}{\rho} + \frac{u^2}{2} - g \cdot z(l) = \text{const}$

See also

Physics / Mechanics / Continuum mechanics / Fluid Mechanics / Fluid Dynamics / Fluid flow / Navier–Stokes equation

[Bernoulli equation]