Computional Fluid Dynamics

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created: July 6, 2025, version: July 6, 2025

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1 Conservation principles

Reynolds transport equation [1]:

Mass conservation:

$$\frac{\partial \rho}{\partial t} + \nabla \cdot (\rho \boldsymbol{v}) = 0 \tag{1}$$

Momentum conservation:

$$\rho \left(\frac{\partial \boldsymbol{v}}{\partial t} + \boldsymbol{v} \cdot \nabla \boldsymbol{v} \right) = -\nabla p + \mu \nabla^2 \boldsymbol{v} + \rho \boldsymbol{g} \tag{2}$$

References

[1] R. B. Bird, W. E. Stewart, E. N. Lightfoot, and D. J. Klingenberg, *Introductory Transport Phenomena*. Hoboken, NJ: Wiley, 2015, 784 pp.