6. Incompressibility

22. November 2023

Problem 1.
Let us have a general velocity field $\mathbf{u}$ with the density ρ. Consider a volume $\mathcal{V}(t)$ inside the fluid in time t composed of particles that take the volume $V(t_0)$ at the initial time t_0. How can be expressed the fact that the field is incompressible? What does it mean for the velocity? What does it mean for the density?

Problem 2.
Consider the flow with velocity $\mathbf{u} = (x, y, 0)$. Is this flow incompressible?