

Christian DiPietrantonio
ME M311: Computational Methods to Viscous FLOws
Video Assignment 01
February 6, 2026

Problem Statement: Watch all the video lectures, and derive the governing equation for the kinetic energy, defined as $k = 1/2(u^2 + v^2 + w^2)$. The technique involves multiplying the x-momentum equation by the u velocity, y-momentum by the v velocity, and z-momentum equation by the w velocity, and eventually add all three equations up. Show your derivation process.

Solution:

First, we must start with the momentum equations as mentioned above.