

Problem 268A

Using an infinitesimal control volume of dimensions dx and dy show that turbulent fluctuating velocities give rise to a net time-averaged flux of x -momentum out of the control volume through the sides of length dy . Show that this additional net x -momentum flux may be conceptually converted to an additional normal stress on the sides of length dy and derive an expression for this additional normal stress in terms of the fluctuating or turbulent velocities.