ME637 **HW SET 5**

1. For aerosol particles with diameters of 0.05, 0.5, 5 and $50\,\mu m$, evaluate the deposition velocities due to diffusion, eddy impaction and gravitational sedimentation. Assume a turbulent flow near a wall with u*=25 cm/s and $\nu_{air} = 0.15\,cm^2/s$. For a concentration of 10^4 particles$/cm^3$, evaluate the total number of particles that deposit per unit time on a $0.1\,m^2$.

2. Find the average number of positive charge that a 1 μm aerosol will carry under equilibrium condition. Evaluate the corresponding electrostatic terminal velocity in the presence of an imposed electric field of 200 volt/cm. Also evaluate the percentage of the aerosols that have no charge.