Homework problems on Fluid Dynamics

(1.63J/2.21J)

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8-osc-ekman.tex

Ex 8. *Ekman layer under oscillatory flow.*

Consider the Ekman boundary layer near the seabed $z = 0$ forced by tidal oscillations in the sea. Let the horizontal velocty of the tide just above be

$$\Re(U_o e^{i\omega t}),\ \Im(V_o e^{i\omega t}) \tag{1}$$

where (U_o, V_o) are real constants. Find the vertical structure of the Ekman layer in the presence of earth rotation. Discuss the mass flux across the entire layer and the bottom shear stress.