

MAST-693 and CIEG-693 Homework #3 (due May-1, 2020)

1. What are the limitations on σ in order to have internal waves? What happens if $\sigma > N$?
2. Are linear internal waves dispersive or non-dispersive? Why?
3. If a wave is propagating in the (x,y,z) plane, what is the non-rotating ($f=0$) dispersion relationship $\sigma(k, l, m)$?
4. For non-rotating ($f=0$) plane internal waves, at what angle of propagation ϕ are $|c|$ and $|c_g|$ the same?
5. Assuming a deep ocean constant $N = 0.002 \text{ rad s}^{-1}$, what is the angle relative to the horizontal made by an internal wave with periods: (a) 2 h period (b) semi-diurnal internal wave period of 12 h? (c) diurnal internal wave period 24 h.