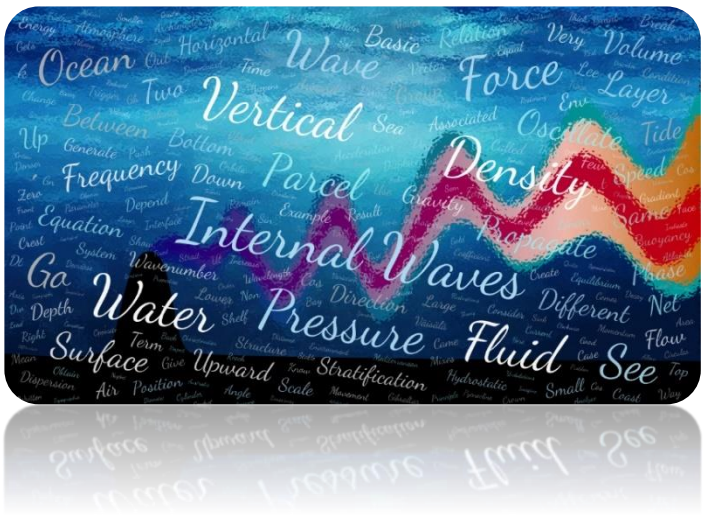
M1-SOAC TD4

Chapter 4: Internal Waves



Question a:

Derive a 4x4 system of equations in the $x - z$ plane to show that the term involving the horizontal wavenumber in the denominator of the dispersion relation for internal waves comes from the non-hydrostatic vertical acceleration term.

Question b:

Consider *a shelf break* (transition between shallow shelf and deep ocean) at depth 500 m. The density difference between the surface and this depth is 0.2 kg/m3. The semi-diurnal tide forces internal waves that emanate from the shelf break and can be seen at the surface as two parallel lines.

➥ What is the distance between these two lines?