

Unit 5 ATM478/678 Mesoscale Dynamics

1. Undergraduate students: Assume that air density is $\rho = 1.225 \text{ kg m}^{-3}$ at sea level. Determine the horizontal pressure difference that is needed in the bottom part of a sea-breeze circulation, to drive an onshore wind that accelerates from 0 to 6 m s^{-1} in 6 h. Discuss your results.
2. Graduate students: Marine-air of thickness 500 m and virtual temperature 16°C is advancing over land. The displaced continental-air virtual temperature is 20°C . Find the sea-breeze front speed, and the sea-breeze wind speed. Discuss your results including the assumptions you made.