

Latitudearen kalkulua

Eremu jakin batean, irrati-zunda batek 24 m/s-ko haize abiadura neurtu du, 2 km-ko altitudetan. Inguru horretan bi isobara daude, elkarrengandik 250 bat km-ra daudenak, eta bien artean 8 hPa-ko aldea dute.

- Demagun airearen dentsitatea $\rho = 1.29 \text{ kg/m}^3$ dela. Zein latitudean gaude?
- Atmosferaren batez besteko temperatura $20 \text{ }^\circ\text{C}$ da, eta dentsitatea, itsasoaren mailan, $\rho = 1.29 \text{ kg/m}^3$ baina altueraren arabera aldatzen dela. Zein latitudean gaude?

$$\begin{aligned} v &= 24 \text{ m/s} \\ d &= 250 \text{ m/s} \\ \Delta P &= 800 \text{ Pa} \\ h &= 2000 \text{ m} \\ \omega &= 7.27 \cdot 10^{-5} \text{ s}^{-1} \end{aligned}$$

$$a) \rho = 1.29 \text{ kg/m}^3$$

ϕ ?

$$\omega = \left| \frac{1}{f\rho} \frac{\Delta P}{\Delta x} \right|$$

$$f = 2\Omega \sin \phi$$

$$\sin \phi = \frac{1}{2\Omega \sigma \rho} \frac{\Delta P}{\Delta x}$$

$$\phi = \arcsin \left(\frac{1}{2\Omega \sigma \rho} \frac{\Delta P}{\Delta x} \right)$$

$$\phi = 45^\circ //$$

$$b) T_m = 293 \text{ K}$$

$$z_1 = 0 \text{ m}$$

$$\rho_1 = 1.29 \text{ kg/m}^3$$

ρ_2 ?

$$z_2 = h = 2000 \text{ m}$$



$$P_2 = P_1 e^{-\frac{z_2 - z_1}{H}}$$

$$H = \frac{RT}{g M \cdot 10^{-3}}$$

$$g = 9.8 \text{ m/s}^2$$

$$M = 29$$

$$P = \frac{RT}{M \cdot 10^{-3}} \rho$$

$$P_2 = P_1 e^{-\frac{z_2 - z_1}{H}}$$

$$H = 8557 \text{ m}$$

$$\rho_2 = 1.02 \text{ kg/m}^3$$

$$\phi = \arcsin \left(\frac{1}{2\Omega \sigma \rho_2} \frac{\Delta P}{\Delta x} \right)$$

$$\phi = 64^\circ //$$