

### Problema n. 1

a)

$$\Delta p = \frac{p\gamma}{v} \frac{\partial \phi}{\partial t} = v\rho_0 \frac{\partial \phi}{\partial t}$$

$$\Delta p_{max} = v\rho_0\psi_0 2\pi\nu$$

$$v = \sqrt{\frac{\gamma RT}{\mu}} = 342.6 \text{ m/s}$$

$$\rho_0 = M_{mole}/V_{mole} = 1.3 \text{ kg/m}^3$$

$$\Delta p_{max} = 0.025 \text{ atm}$$

$$\Delta p' = \Delta p \sqrt{T/T'} = 0.024 \text{ atm}$$

b)

$$\Delta \rho = \frac{\Delta p}{v^2} = 2.17 \cdot 10^{-7} \text{ kg/m}^3$$

$$\Delta \rho' = \Delta \rho (T/T')^{3/2} = \dots$$

c)

$$I = 1/2 \rho_0 \omega^2 \psi_0^2 v = 7.12 \cdot 10^{-7} \text{ W/m}^2 = 58.5 \text{ dB}$$

$$\delta_{rosso} = 3.567 \cdot 10^{-2} \text{ rad}$$

$$\Delta x_{specchio} = \Delta \delta \cdot d = 1.955 \text{ mm}$$

### Problema n. 2

Commento: questo esercizio e' nato come fusione di due altri esercizi, ma e' venuto male...

a)

$$v_{Al} = \nu \lambda = \nu 2L = 5000 \text{ m/s}$$

b)

$$\frac{v_{air}}{v_{Al}} = \sqrt{\left(\frac{\gamma p \rho_{Al}}{Y \rho_{air}}\right)}$$

c)

$$x = \lambda/4 = v/(4\nu) = 1/3 \text{ m}$$

d)

$$v_{tran} = \sqrt{N/\rho} \quad , \quad N < Y \Rightarrow v_{\perp} < v_{\parallel}$$

### Problema n. 3

a)  $\lambda = 2L \quad v_s = \lambda \nu \quad \nu = \sqrt{\gamma RT/m}/(2L)$

$$\Delta \nu = \sqrt{\gamma R/m} \frac{\sqrt{T+t} - \sqrt{T}}{2L}$$

$$\sqrt{\gamma R/m} = \frac{v_s}{\sqrt{T}} = 20 \text{ t} = 25.3^\circ$$