

ONDE ACUSTICHE
SONORE

=

ONDE ELASTICHE
(ONDE DI DENSITA'/PRESSIONE
DELL'ARIA)

ONDE ACUSTICHE



$n \approx 220 \text{ m/s}$

PROPAGAZIONE

VELOCITÀ DI
PROPAGAZIONE
ONDE AUSTICHE
=

VELOCITÀ DEL SUONO

v_s → CONDIZIONI DEL
MEZZO IN CUI VIAGGIA

NELL'ARIA

$$T = 0^{\circ}\text{C}$$

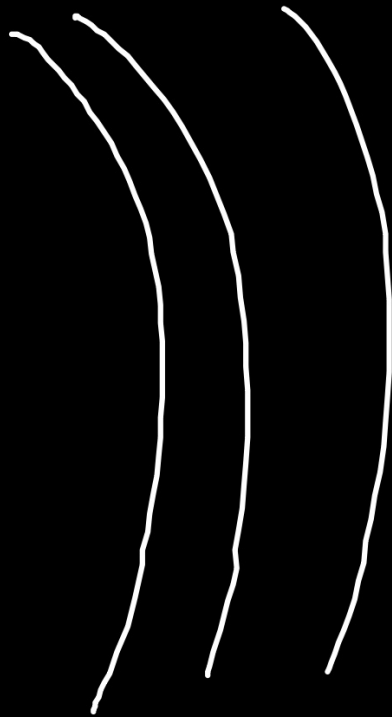
$$v_s = 332 \text{ m/s}$$

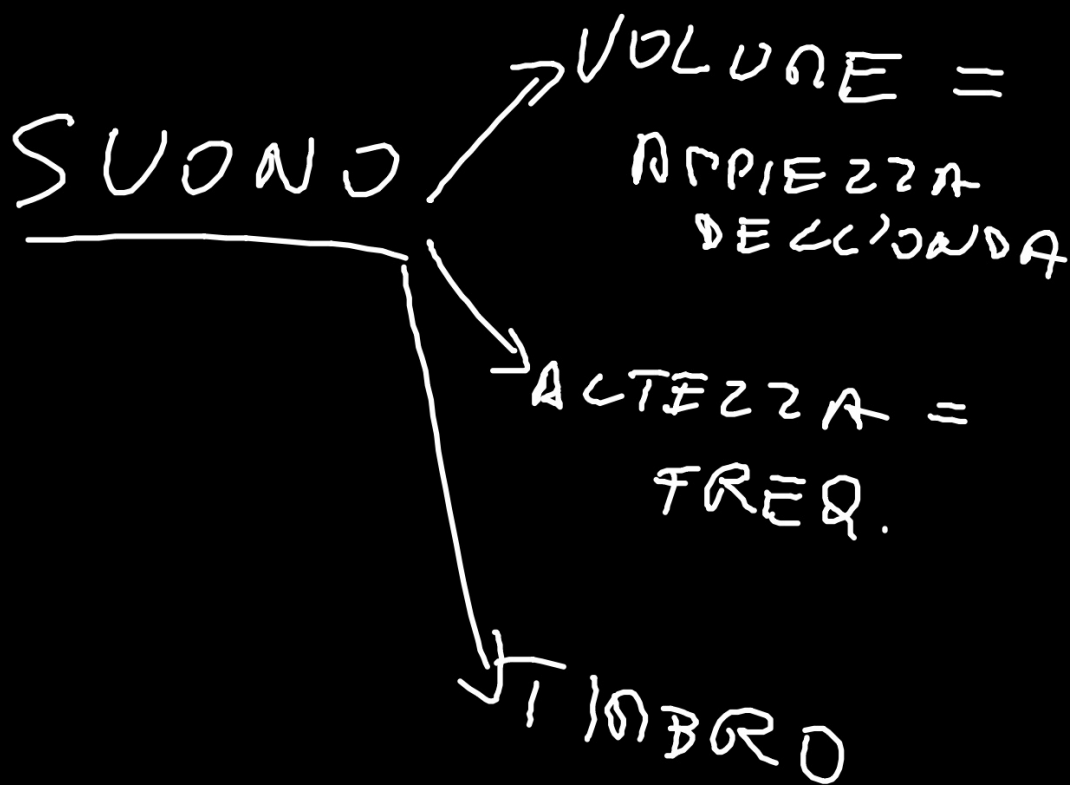
$$\approx \underline{1200 \text{ Km/h}}$$

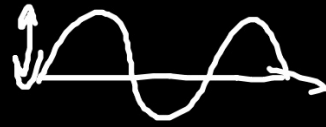
$$T \sim 20^{\circ}\text{C} \quad v_s = 340 \text{ m/s}$$

$$v_s = \lambda \cdot \nu \quad \text{Hz}$$

II







VOLUME = AMPIEZZA

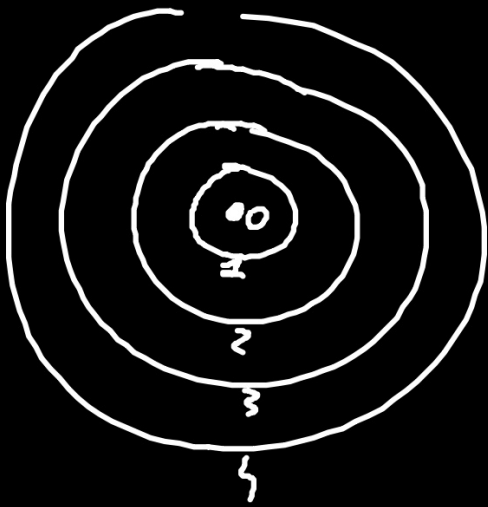


INTENSITA' DEL
SUONO

•))) $\overset{A}{\square}$

$$I = \frac{E}{A \cdot \Delta t} \quad \frac{W}{m^2}$$

$$W = \frac{J}{s}$$



$$\bar{I}_1 \cdot A_1 = \bar{I}_2 \cdot A_2$$

$$A = 4\pi \cdot r^2$$

$$\bar{I}_1 \cdot 4\pi r_1^2 = \bar{I}_2 \cdot 4\pi r_2^2 = \text{const}$$

$$I(r) \cdot r^2 = \text{cost.}$$

$$I(r) = \frac{\text{cost}}{r^2}$$

I (INTENSITA'
DEL SUONO)

I_0 = MINIMA INTENSITA'
PERCEPIBILE
DALL'ORECCHIO UMANO
= 10^{-12} W/m^2

MISURA INTERSTA'

DEL SUONO

↓

DECIBEL

dB

$$\text{dB} \Rightarrow L_s$$

$$L_s = 10 \log_{10} \frac{I}{I_0}$$

$$\log_a b = c \quad b > 0$$



$$a^c = b$$

$$a > 0$$

$$a \neq 1$$

$$\log_{10} 100 = 2 \iff 10^2 = 100$$

$$\log_2 4 = 2 \iff 2^2 = 4$$

$$\underline{I} = \underline{I}_0$$

$$L_s = 10 \cdot \log_{10} \frac{I_0}{\underline{I}_0} = 0 \text{ dB}$$

$$\log_{10} 1 = 0$$

0

$$I_1 = 10 \cdot I_0$$

$$L_s(I) = 10 \cdot \lg_{10} \frac{I_1}{I_0} =$$

$$= 10 \cdot \underbrace{\lg_{10} 10}_1 = 10 \text{ dB}$$

$$I_2 = 100 I_0$$

$$L_s(2) = 10 \cdot \underbrace{\log_{10} \frac{100 I_0}{I_0}}_2 = 20 \text{ dB}$$