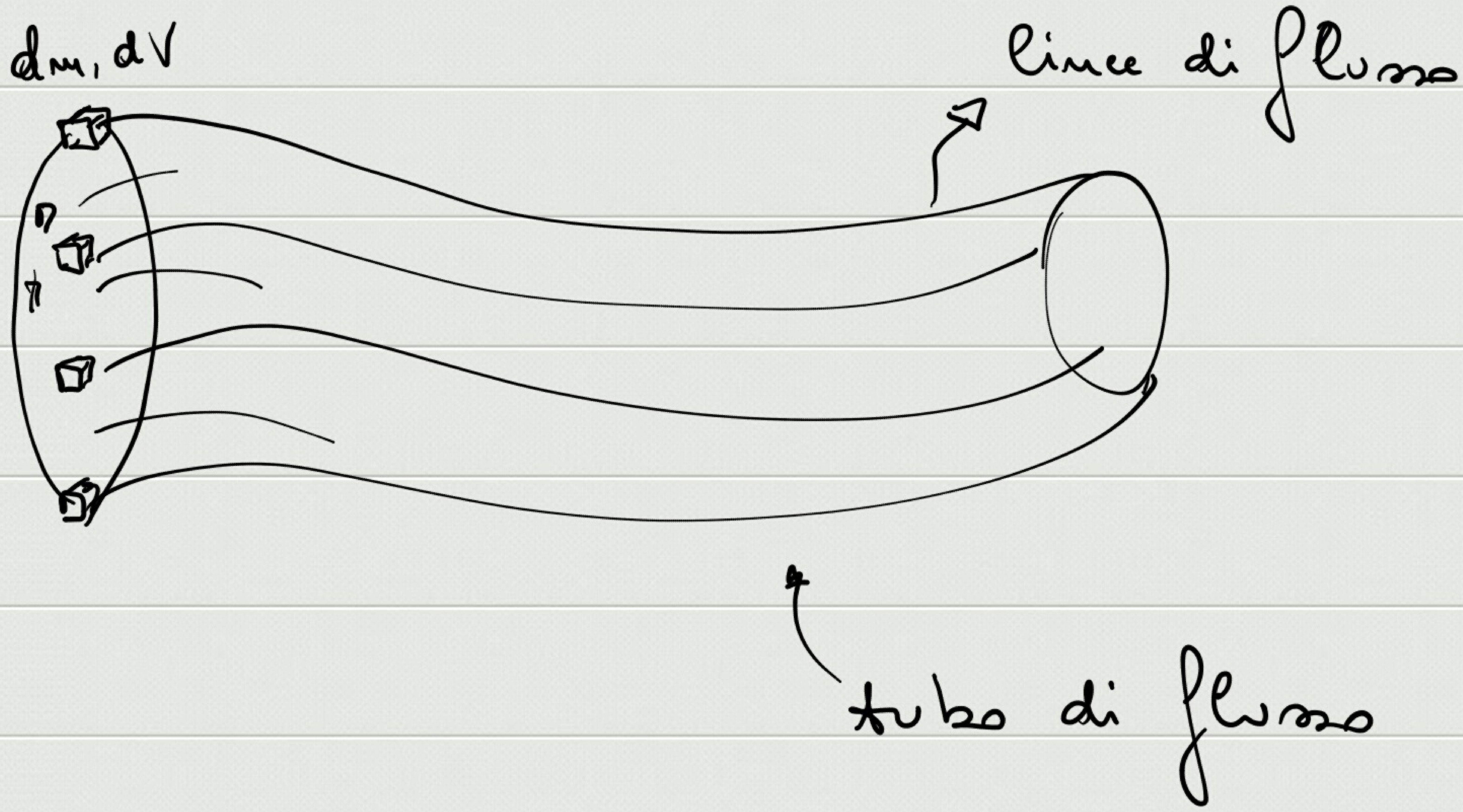
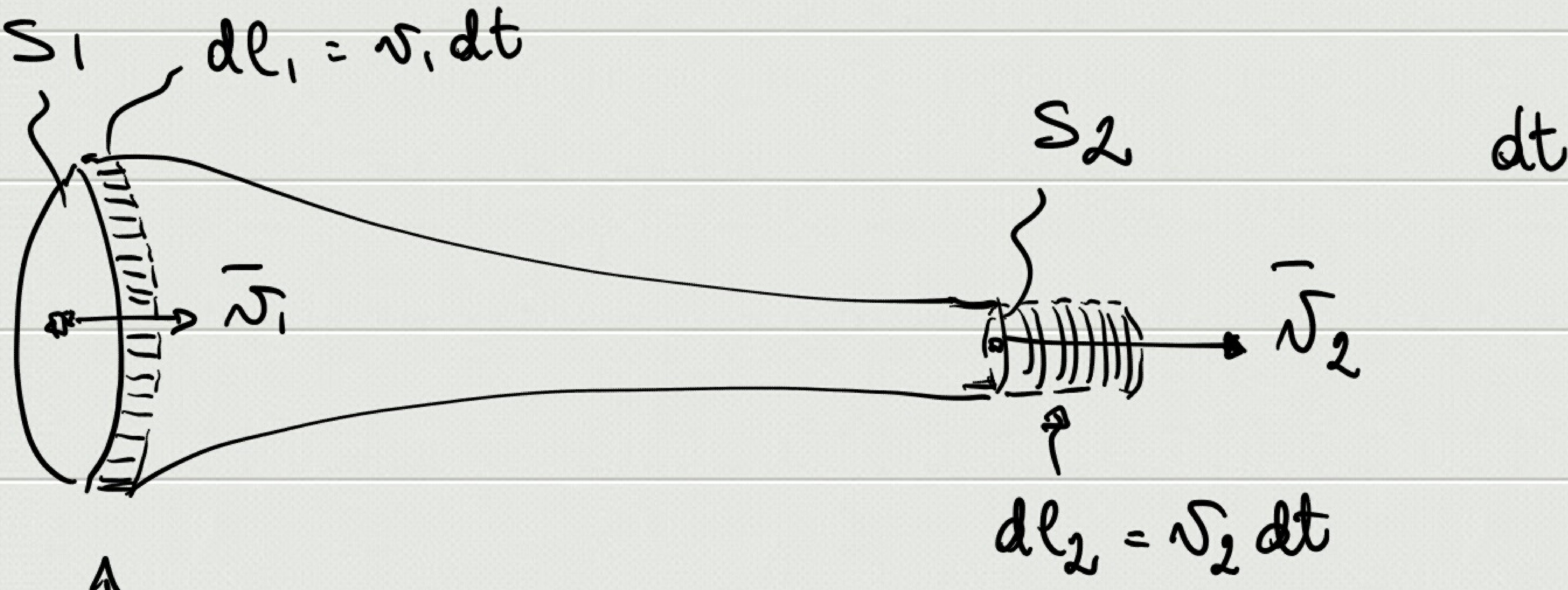
Fluido Ideale : $\eta = 0$ $\rho = \text{cost}$

Moto laminare $\Rightarrow$ no moti "vorticosi"

Moto "stazionario"





$$dm_1 = \rho\, dV_1 = \rho\, S_1 v_1\, dt$$

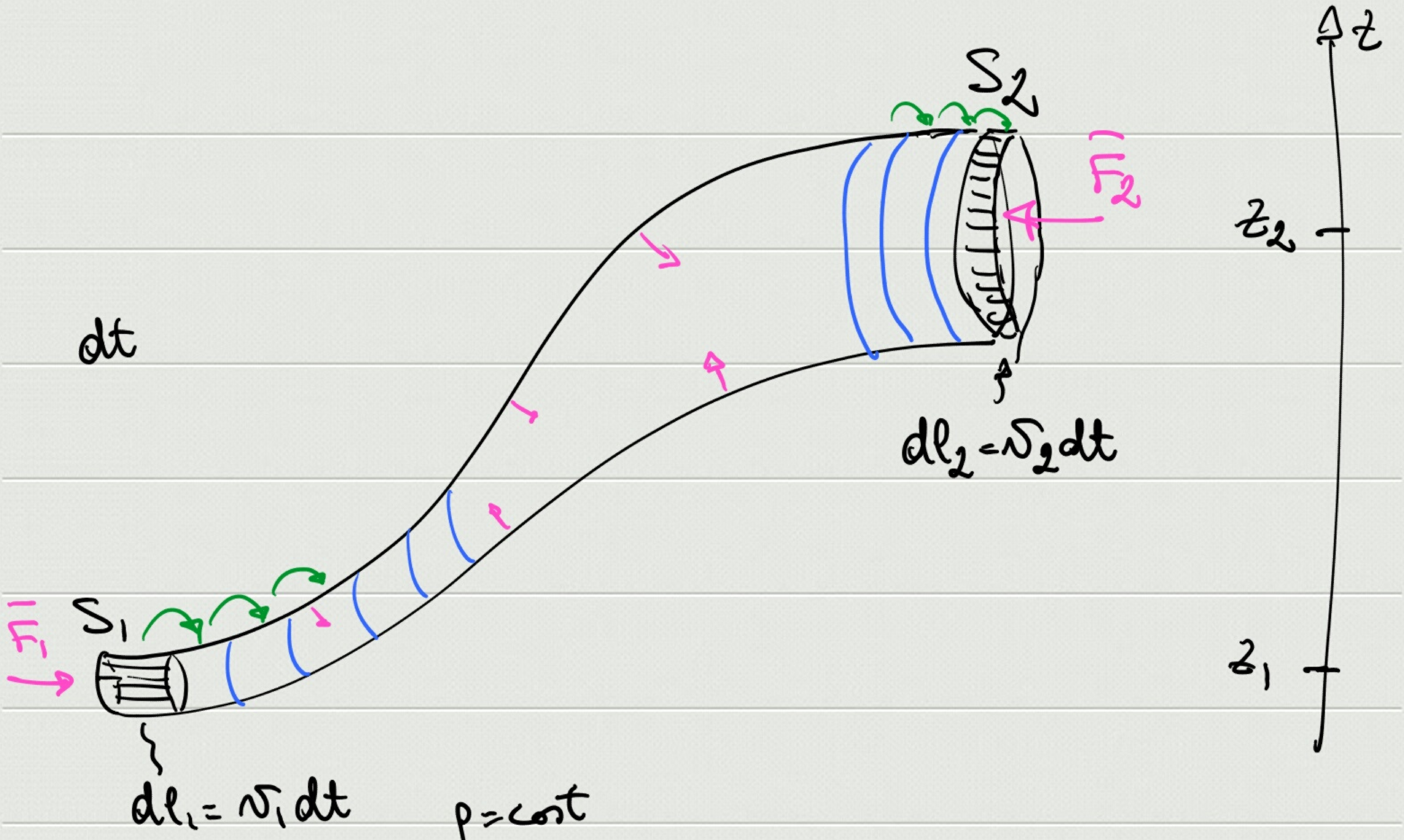
$$dm_2 = \rho\, dV_2 = \rho\, S_2 v_2\, dt$$

$$dm_1 = dm_2 \quad \Rightarrow \quad \boxed{v_1 S_1 = v_2 S_2}$$

portata $\boxed{q = vS = \text{costante}}$

$$\boxed{v_m = \frac{1}{S}\int_S v\, dS}$$

$$dq = v\, dS \quad \Rightarrow \quad q = \int_S dq = \int_S v\, dS = v_m S$$



$\rho = \text{cost}$

$$dm_1 = dm_2 \Rightarrow dV_1 = dV_2 = dV$$

$$\boxed{dE_k = dW_{TOT}}$$

$$dW_{TOT} = \underset{\text{peso}}{dW_{vol}} + \underset{\text{pressione}}{dW_{sup}}$$

$$dW_{vol} = dW_{peso} = -dE_{p,peso} \qquad *$$

$$-(\cancel{E'_{p_1}} - E_{p_1}) - (\cancel{E'_{p_2}} - \cancel{E_{p_2}}) - (E'_{p,3} - \cancel{E_{p,3}}) - \dots$$

$$* = -(dm\,g\,z_2 - dm\,g\,z_1) = -\rho\,dV\,(z_2 - z_1)$$

$$dW_{sup} = \bar{F}_1 d\bar{l}_1 + \bar{F}_2 d\bar{l}_2 = p_1 S_1 dl_1 - p_2 S_2 dl_2 =$$

$$= (p_1 - p_2)\, dV$$

$$dm = \rho\, dV$$

$$dE_k = \frac{1}{2} dm\, v_2^2 - \frac{1}{2} dm\, v_1^2 = \frac{1}{2} \rho\, dV (v_2^2 - v_1^2)$$

$$\frac{1}{2} \rho (v_2^2 - v_1^2) = -\rho (z_2 - z_1) + (p_1 - p_2)$$

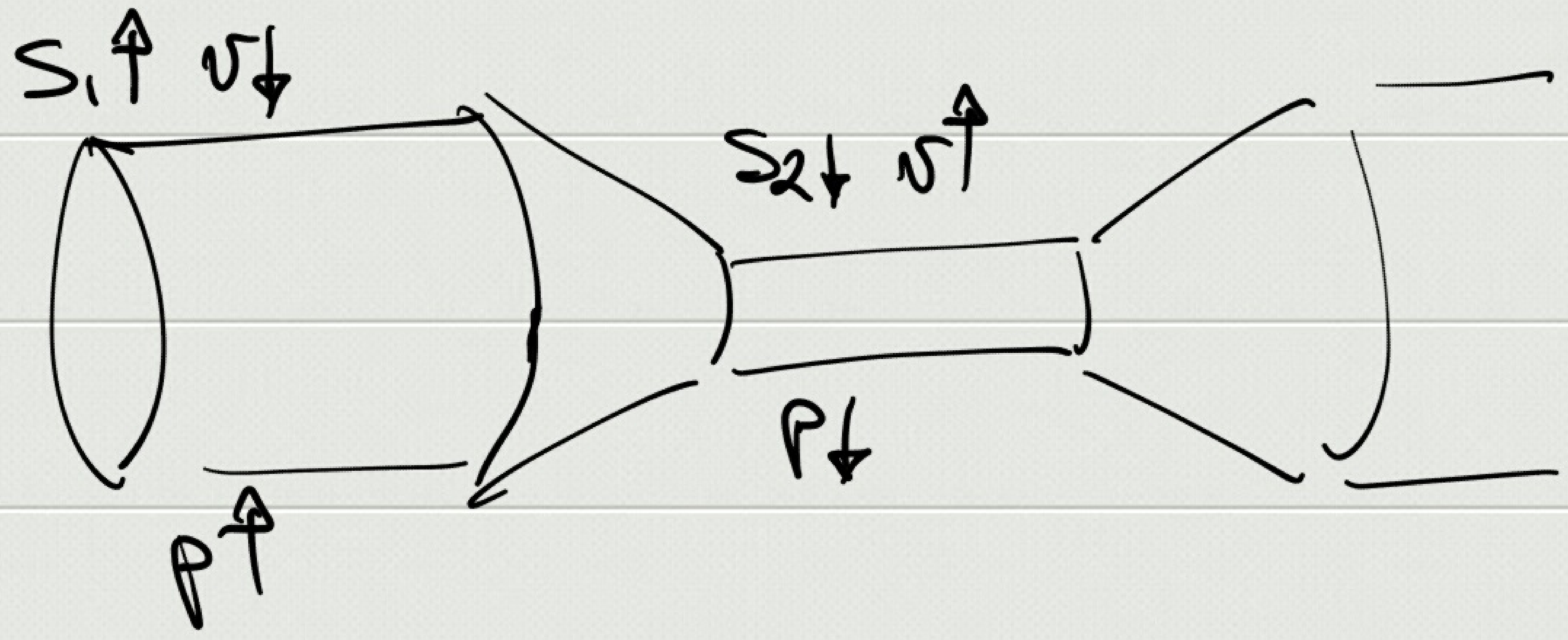
$$p_1 + \rho z_1 + \frac{1}{2} \rho v_1^2 = p_2 + \rho z_2 + \frac{1}{2} \rho v_2^2$$

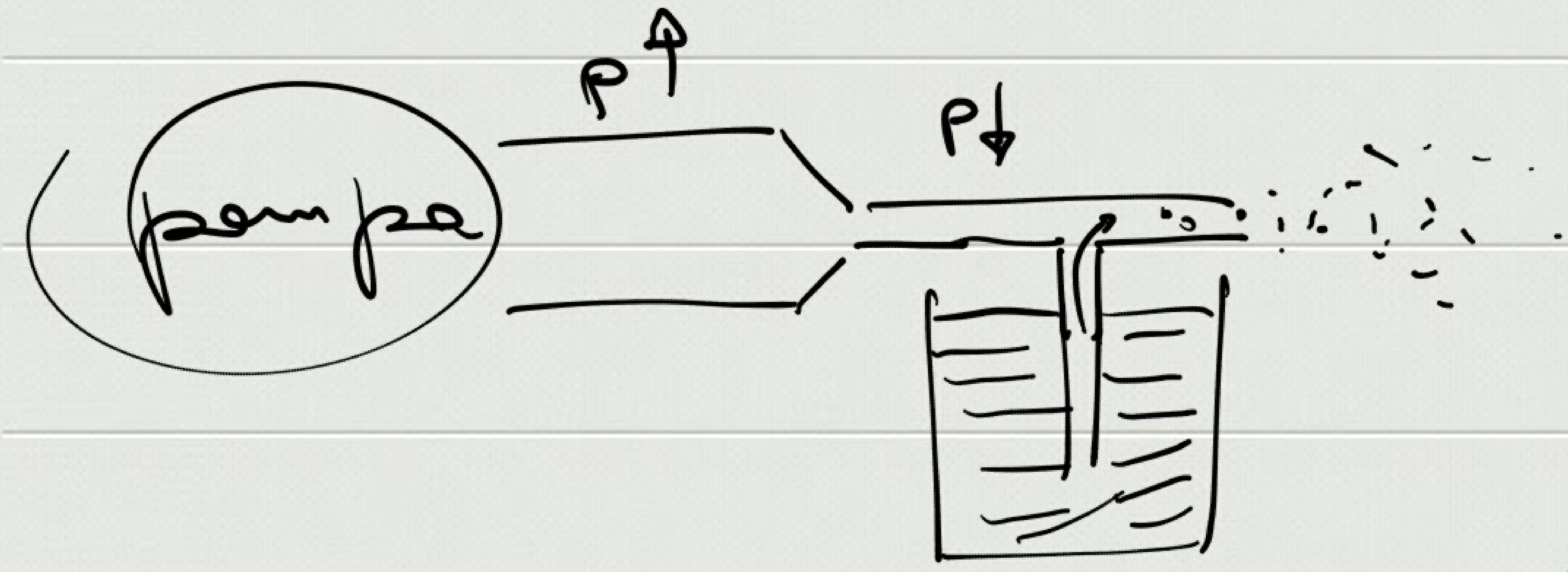
$$\Rightarrow \boxed{p + \rho z + \frac{1}{2} \rho v^2 = cost}$$

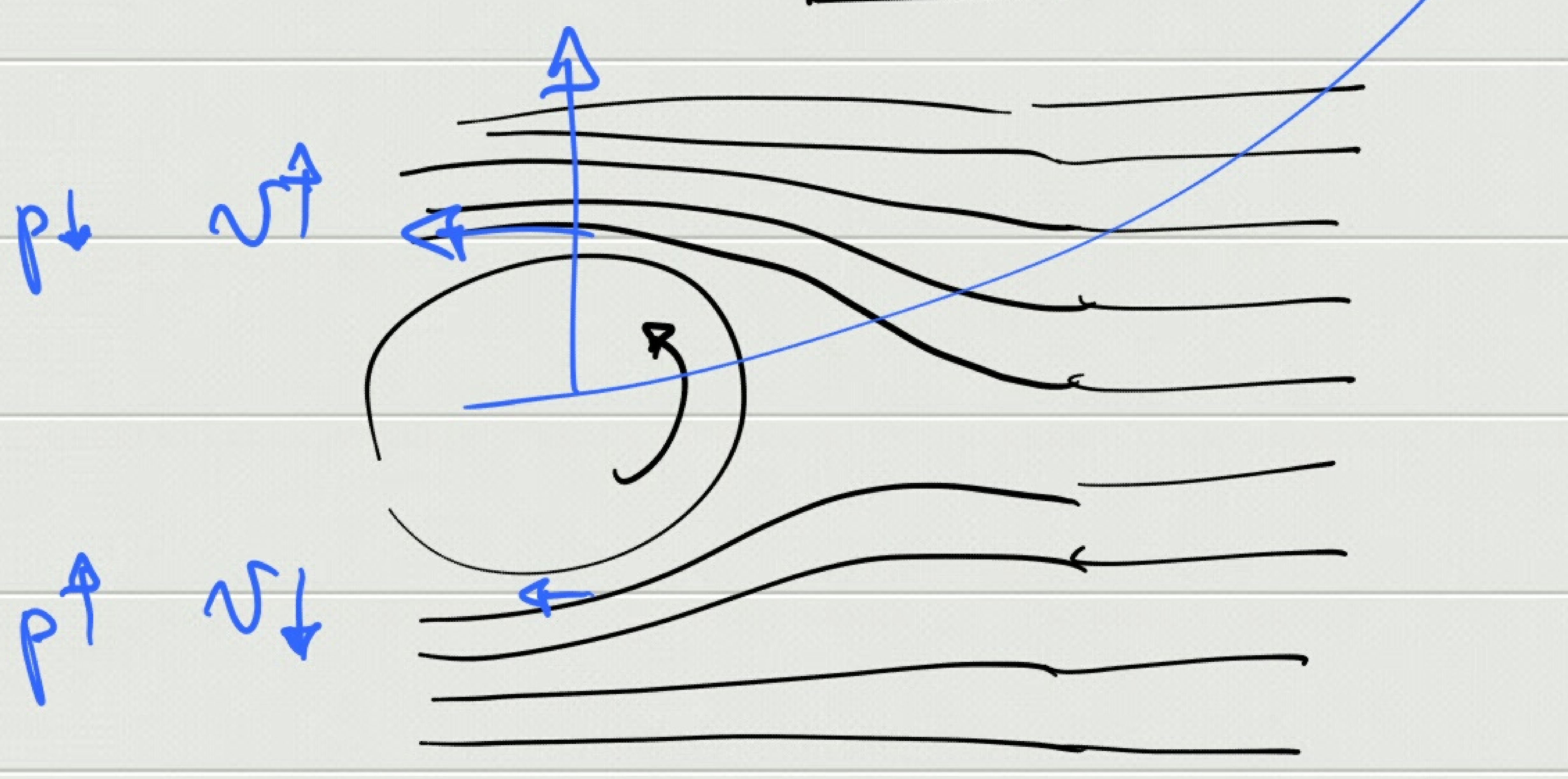
Teorema di Bernoulli

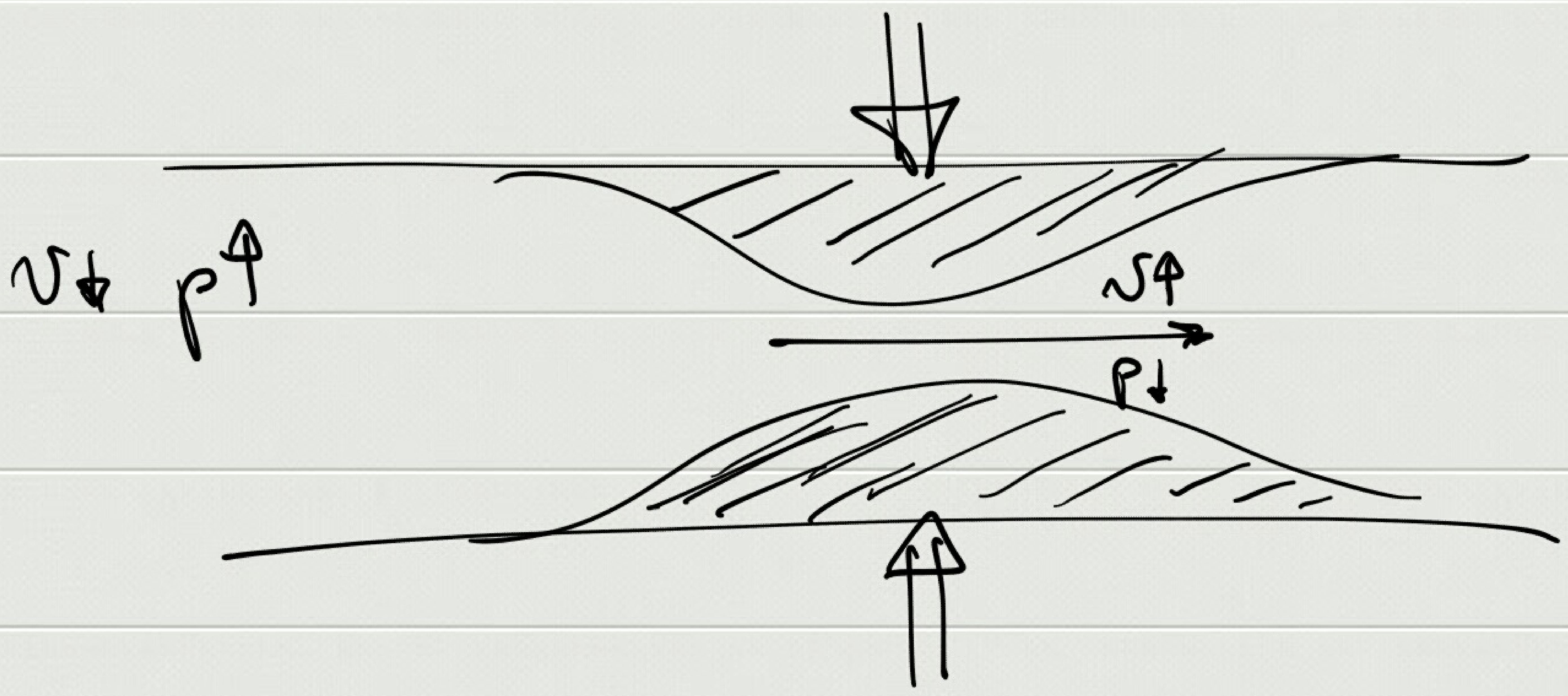
$z = cost$

$q = vS = cost$




pompa
p↑
p↓


p↓ v↑
p↑ v↓


v↓ p↑
v↑
p↓