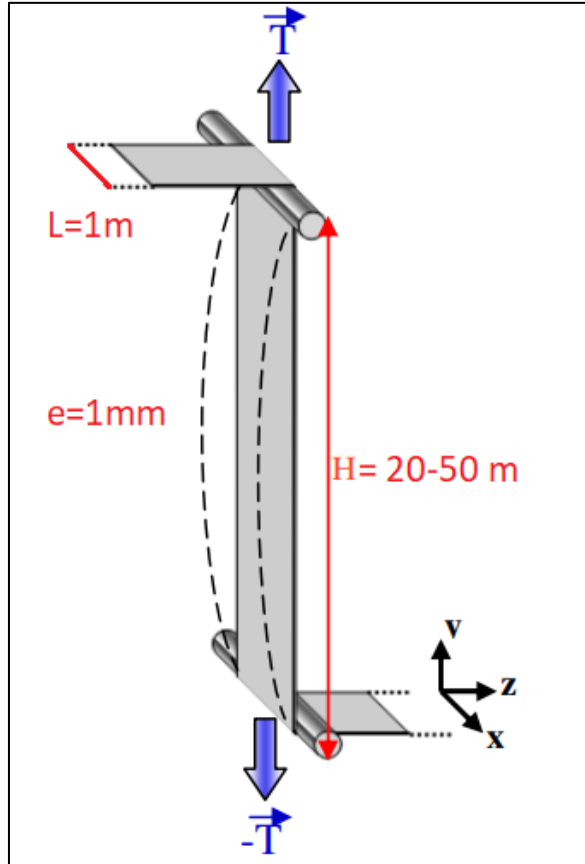


AERO-ELASTIC INSTABILITIES OF A RIGID PLATE IMPACTED BY AN IMPINGING JET

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Plenum
Springs
Axisymmetric nozzle
Rigid plate
Optical laser sensor

Planar and axisymmetric nozzles

L
 e
 d
 $d=2R$
 e

H
 d
 e
 U
 U_A
 z
 A
 B

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Oscillator equation :

$$\ddot{z} + 2\eta\omega\dot{z} + \omega^2z = 0 \quad (1)$$

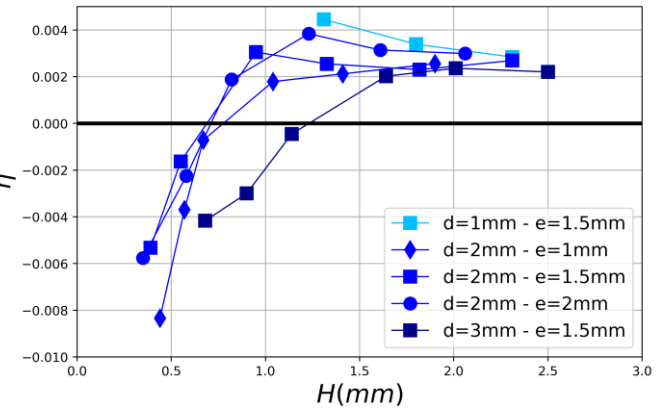
Damping term added by the jet :

$$\eta_a^{circ} = -\pi\rho U_A \frac{(R+e)^3 - R^3}{3\sqrt{km}} \frac{1}{H} \quad (2)$$

$$\eta_a^{plan} = -\frac{\rho U_A L e^2}{2\sqrt{km}} \frac{1}{H}$$

Influence of the nozzle geometry

a) Planar nozzles



b) Axisymmetric nozzles

