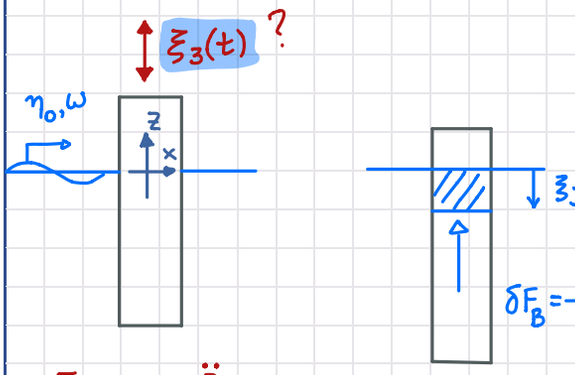


$$\delta F_B = -\rho \cdot g \cdot \delta V = \underbrace{-\rho \cdot g \cdot A_{WL}}_{C_{33}} \cdot \xi_3$$

$$= -C_{33} \cdot \xi_3$$

$$\Sigma F = m \cdot \ddot{\xi}_3$$

$$F^{\Upsilon\Sigma} + F^{\Upsilon\Delta} + F^{E\Xi} = m \cdot \ddot{\xi}_3$$

$$-C \cdot \xi_3 + F^{\Upsilon\Delta} + F^{E\Xi} = m \cdot \ddot{\xi}_3$$

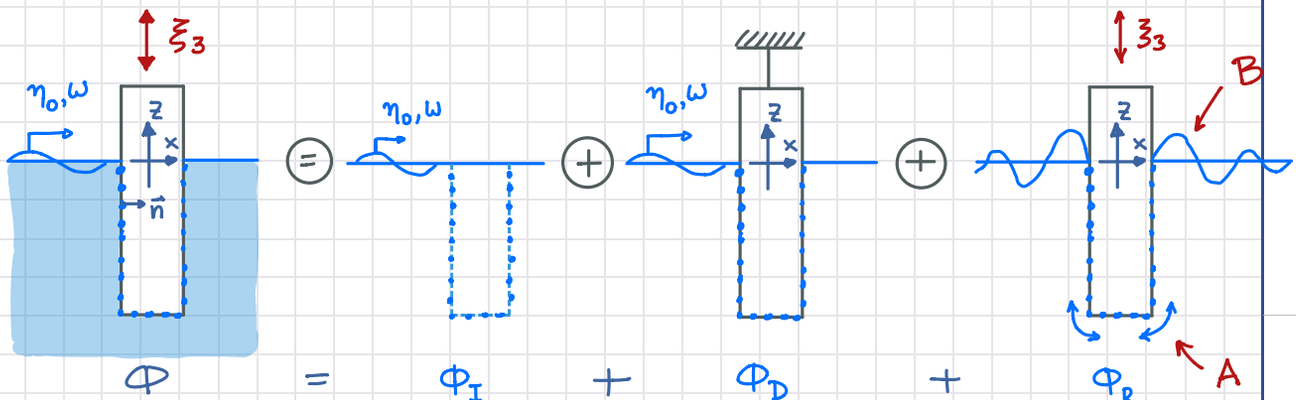
$$m \ddot{\xi}_3 + C \xi_3 = F^{\Upsilon\Delta} \quad (1)$$

$$F^{\Upsilon\Delta} = \int p^{\Upsilon\Delta} \cdot \vec{n} \cdot dA$$

$$p^{\Upsilon\Delta} = -\rho \cdot \frac{\partial \Phi}{\partial t}$$

$$\nabla \Phi = \vec{v}$$

$$\frac{\partial \Phi}{\partial x} \hat{i} + \frac{\partial \Phi}{\partial y} \hat{j} + \frac{\partial \Phi}{\partial z} \hat{k} = (v_x, v_y, v_z)$$



Φ = Φ_I + Φ_D + Φ_R

Φ_I: Δυναμικό ταχύτητας αδιατάραχτου προσπίπτοντος κυματισμού (incident velocity potential)

Φ_D: λόγω της περίθλασης του κυματισμού (diffraction ...)

Φ_R: δυναμικό ακτινοβολίας

$$p = -\rho \frac{\partial \Phi_I}{\partial t} \qquad p = -\rho \frac{\partial \Phi_D}{\partial t}$$

$$F^{\Upsilon\Delta} = F^{FK} + F^{D} + F^{R}$$

(Froude-Krylov)

$$F^{R} = -A_{33} \cdot \ddot{\xi}_3 - B_{33} \cdot \dot{\xi}_3 \quad (2)$$

A_{33}: προσθετη μάζα

B_{33}: συντελεστής απόσβεσης

$$(1) \overset{(2)}{\Rightarrow} m \ddot{\xi} + C \xi = F^{FK} + F^{D} - A \ddot{\xi} - B \dot{\xi}$$

$$\Rightarrow \boxed{(m + A) \ddot{\xi} + B \dot{\xi} + C \xi = F^{FK} + F^{D}} \quad (3)$$

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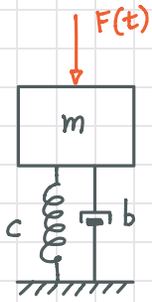


$$m\cdot\ddot{x} + b\cdot\dot{x} + c\cdot x = F(t) = F_0\cdot\cos(\omega t)$$

$$x(t) = X_0\cdot\cos(\omega t) = \mathrm{Re}\left\{X_0\cdot e^{i\omega t}\right\}$$

$$\dot{x} = \mathrm{Re}\left\{i\omega\cdot X_0\cdot e^{i\omega t}\right\} = i\omega\cdot x$$

$$\ddot{x} = \mathrm{Re}\left\{(i\omega)^2 X_0 e^{i\omega t}\right\} = (i\omega)^2\cdot x$$

$$\mathrm{Re}\left\{\left[(i\omega)^2\cdot m + i\omega\cdot b + c\right]\cdot X_0\cdot e^{i\omega t}\right\} = \mathrm{Re}\left\{F_0\cdot e^{i\omega t}\right\}$$

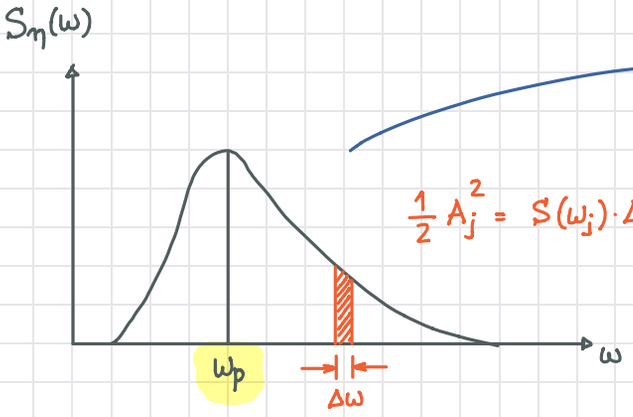
$$\left(-\omega^2\cdot m + i\omega b + c\right)\cdot X_0 = F_0$$

$$\eta = \mathrm{Re}\left\{\eta_0\cdot e^{i\omega t}\right\} \rightarrow \boxed{RAO(\omega)} \rightarrow \xi = \mathrm{Re}\left\{\xi_{3_0}\cdot e^{i\omega t}\right\}$$

$$\eta = \eta_0\cdot\cos(\omega t)$$

$$RAO(\omega) = \frac{|\xi_{3_0}|}{|\eta_0|}$$

Response Amplitude Operator

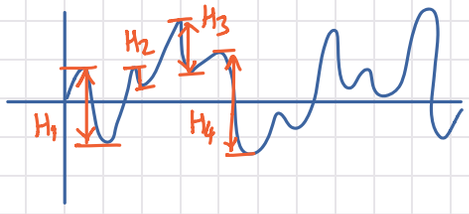


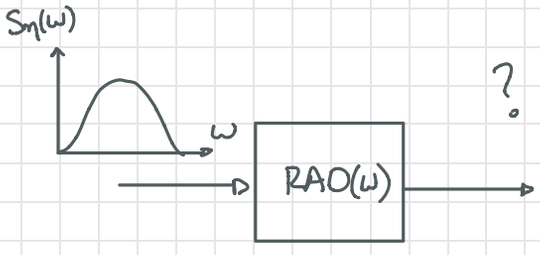
$$\frac{1}{2}A_j^2 = S(\omega_j)\cdot\Delta\omega$$

$$\overline{H} = 2{,}5\cdot\sqrt{m_0}$$

$$H_s = 4\sqrt{m_0}$$

$$m_0 = \int_0^\infty S(\omega)\,d\omega$$

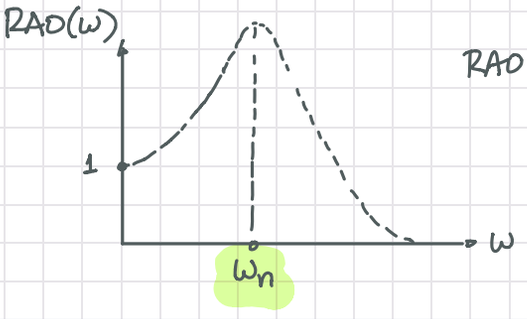




? →

$$S_{\xi_i}(\omega) = |RAO_{\xi_i}(\omega)|^2\cdot S_\eta(\omega)$$

Εξ. Διασποράς: $\omega^2 = g\cdot\frac{2\pi}{\lambda}$



$$RAO = \frac{\xi_3}{\eta_0}$$

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