

ASIGNACIÓN #1

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PLANTEAMIENTO MATEMÁTICO:

$$x_1 = l_1 \sin(\theta_1), \quad y_1 = l_1 \cos(\theta_1)$$

$$x_2 = l_2 \sin(\theta_2), \quad y_2 = l_2 \cos(\theta_2)$$

$$T = \frac{1}{2}m (\dot{\theta}_1^2 + \dot{\theta}_2^2)$$

$$V = -mgl(\cos(\theta_1) + \cos(\theta_2)) + l^2k \cos(\theta_1 - \theta_2)$$

$$\mathcal{L} = \frac{1}{2}m (\dot{\theta}_1^2 + \dot{\theta}_2^2) + mgl(\cos(\theta_1) + \cos(\theta_2)) - l^2k \cos(\theta_1 - \theta_2)$$

USO DE EULER-LAGRANGE:

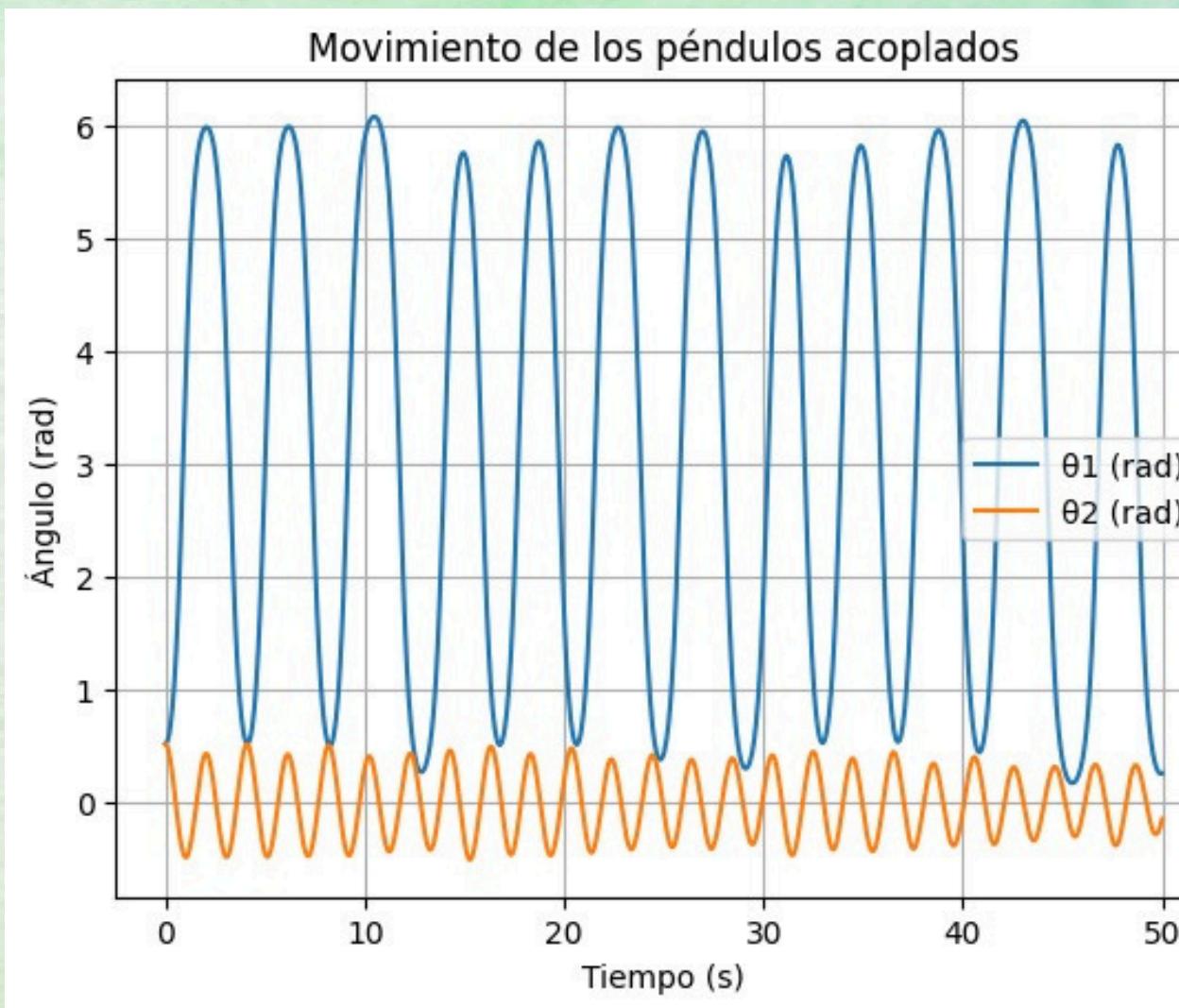
$$\frac{d}{dt} \left(\frac{\partial \mathcal{L}}{\partial \dot{\theta}_1} \right) - \frac{\partial \mathcal{L}}{\partial \theta_1} = 0$$

$$\frac{d}{dt} \left(\frac{\partial \mathcal{L}}{\partial \dot{\theta}_2} \right) - \frac{\partial \mathcal{L}}{\partial \theta_2} = 0$$

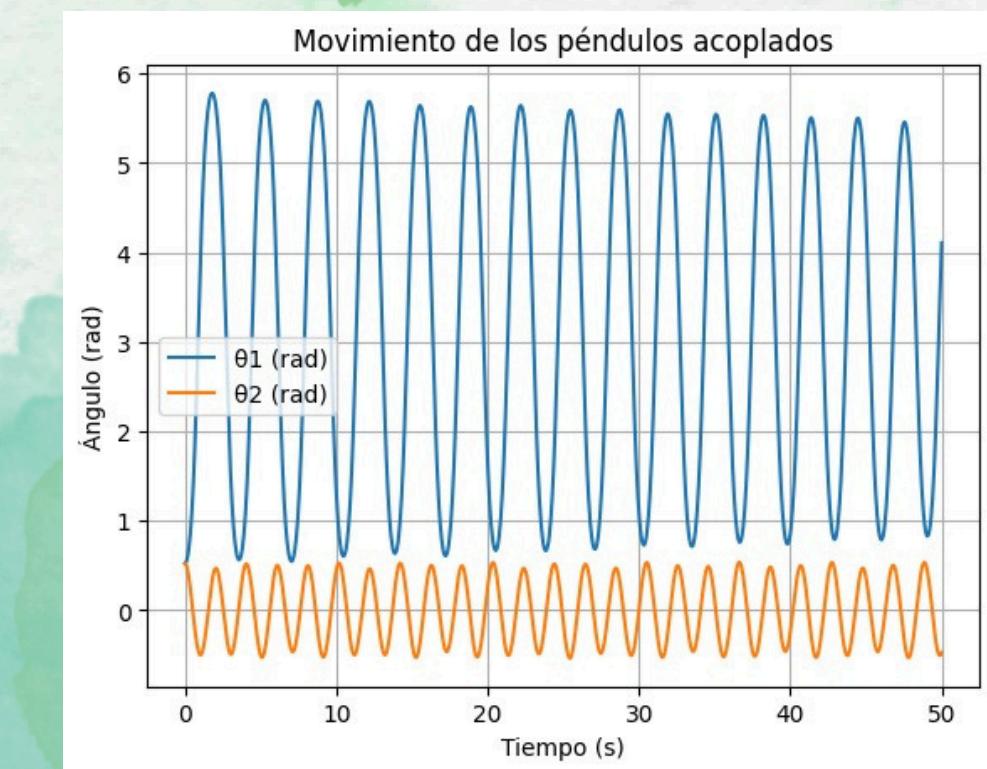
$$\ddot{\theta}_1 = \frac{mg \sin(\theta_1) - kl_1 l_2 \sin(\theta_2 - \theta_1)}{ml^2}$$

$$\ddot{\theta}_2 = \frac{-mg \sin(\theta_2) + kl^2 \sin(\theta_2 - \theta_1)}{ml^2}$$

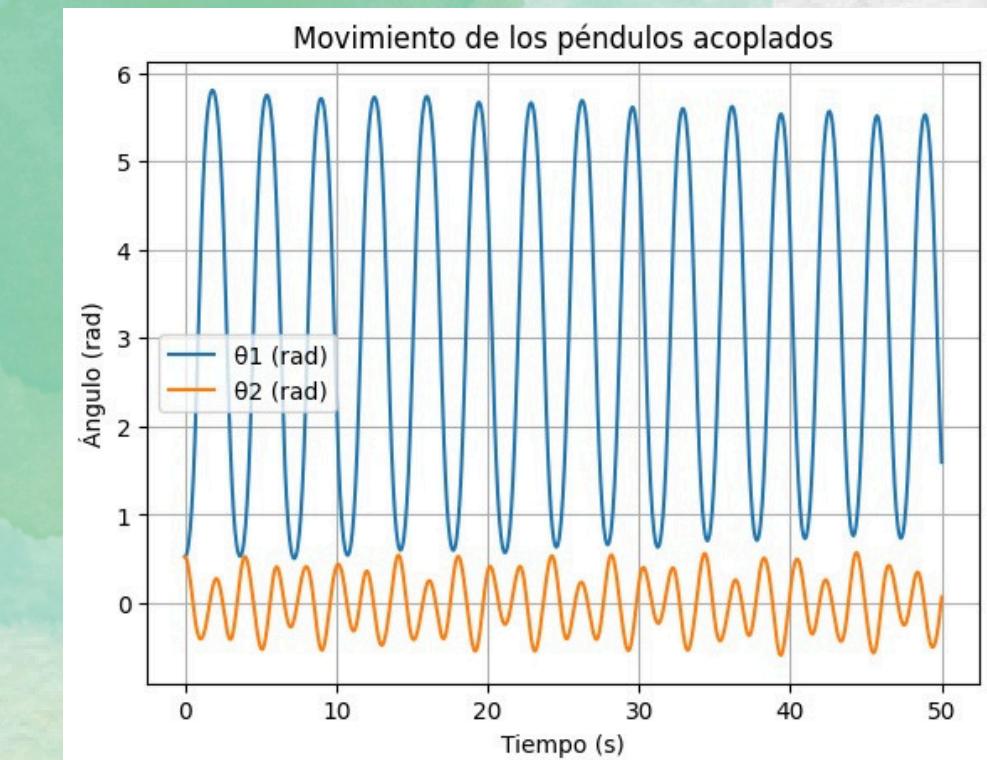
ANALISIS PARA MASAS DIFERENTES:



1 KG - 1KG

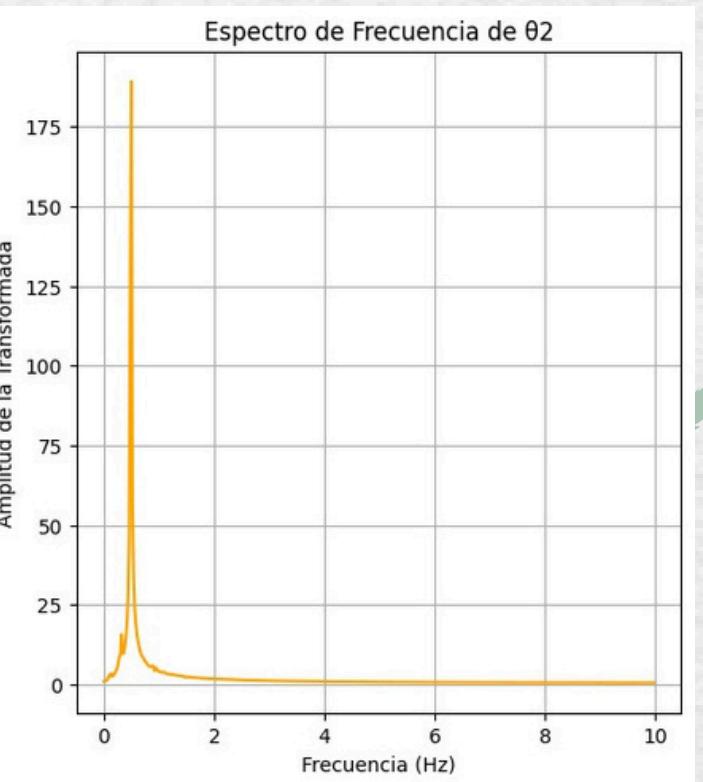
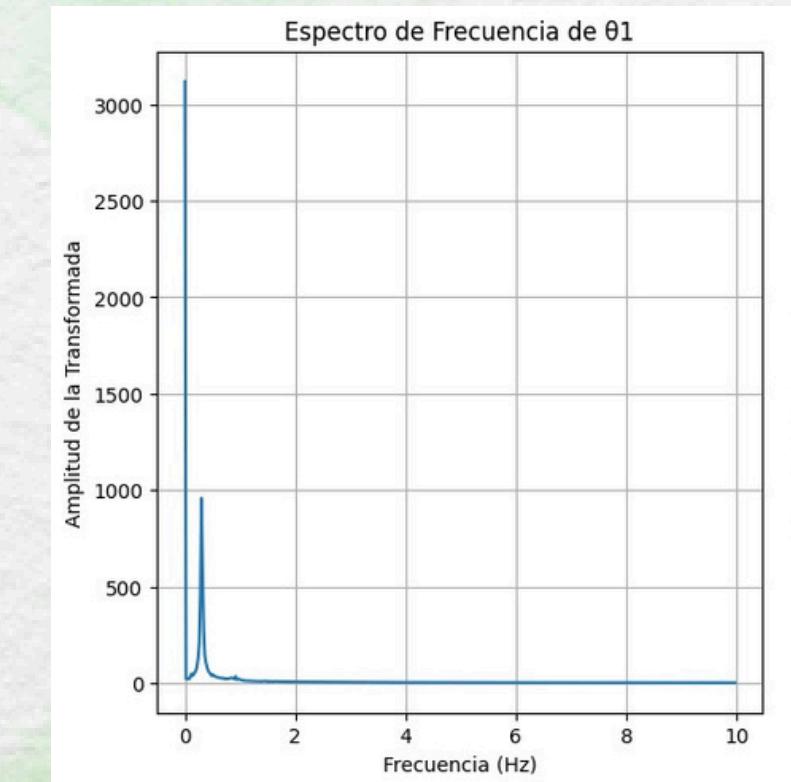
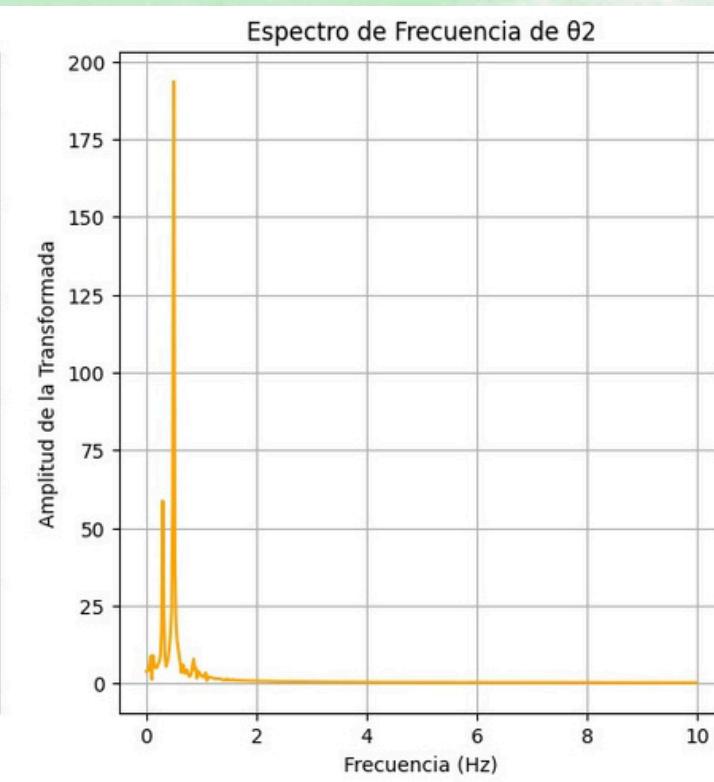
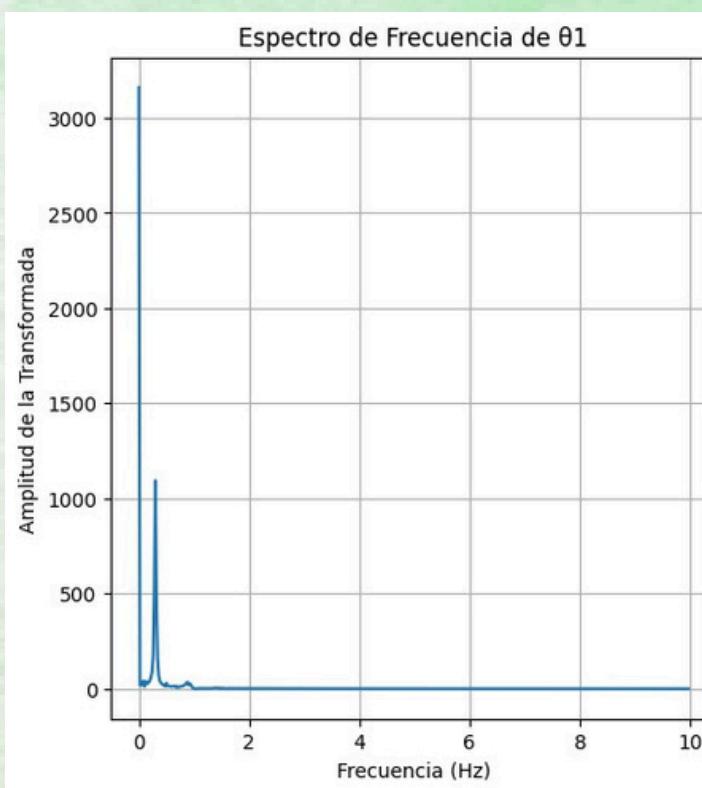


1 KG - 3KG

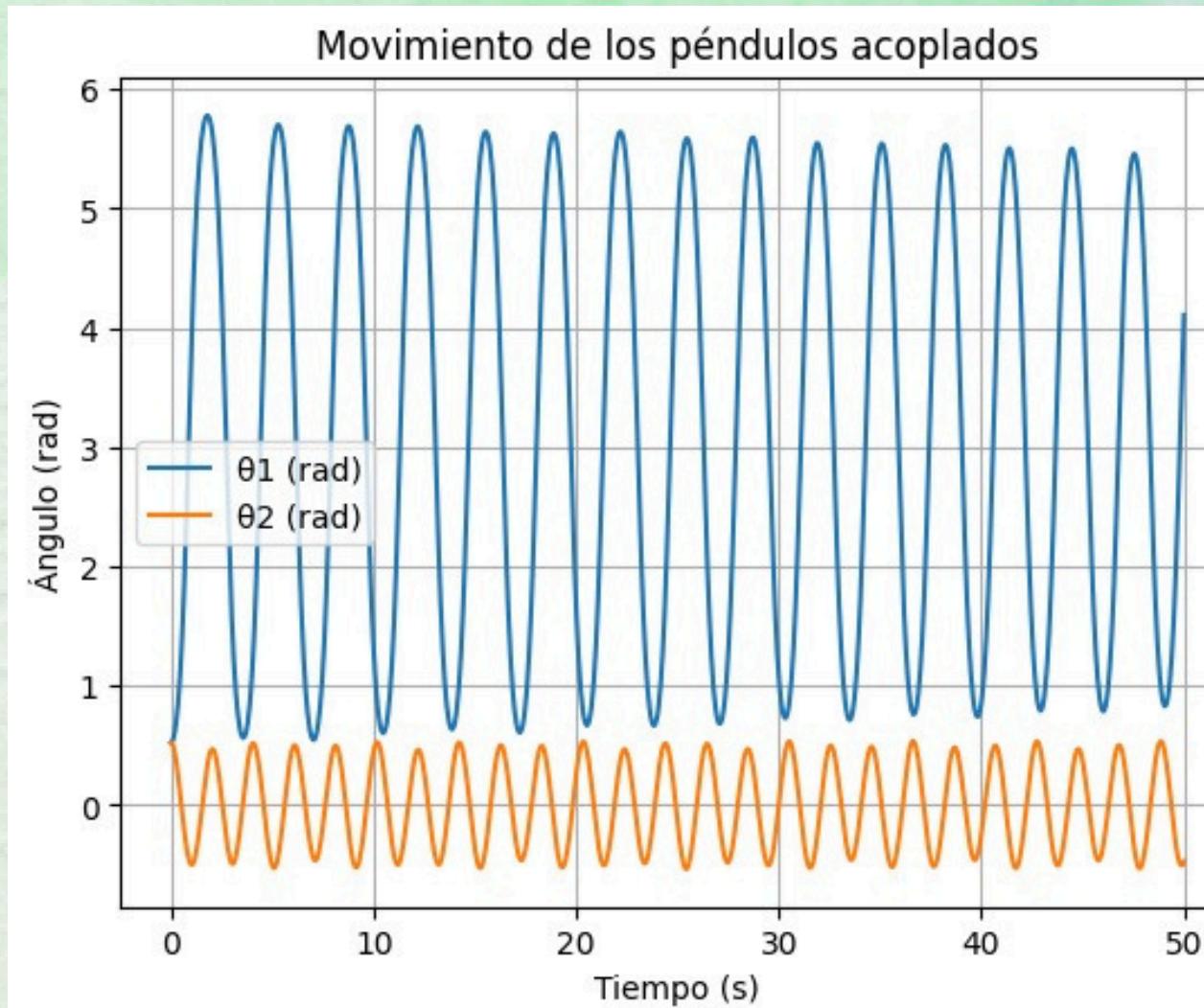


3 KG - 1KG

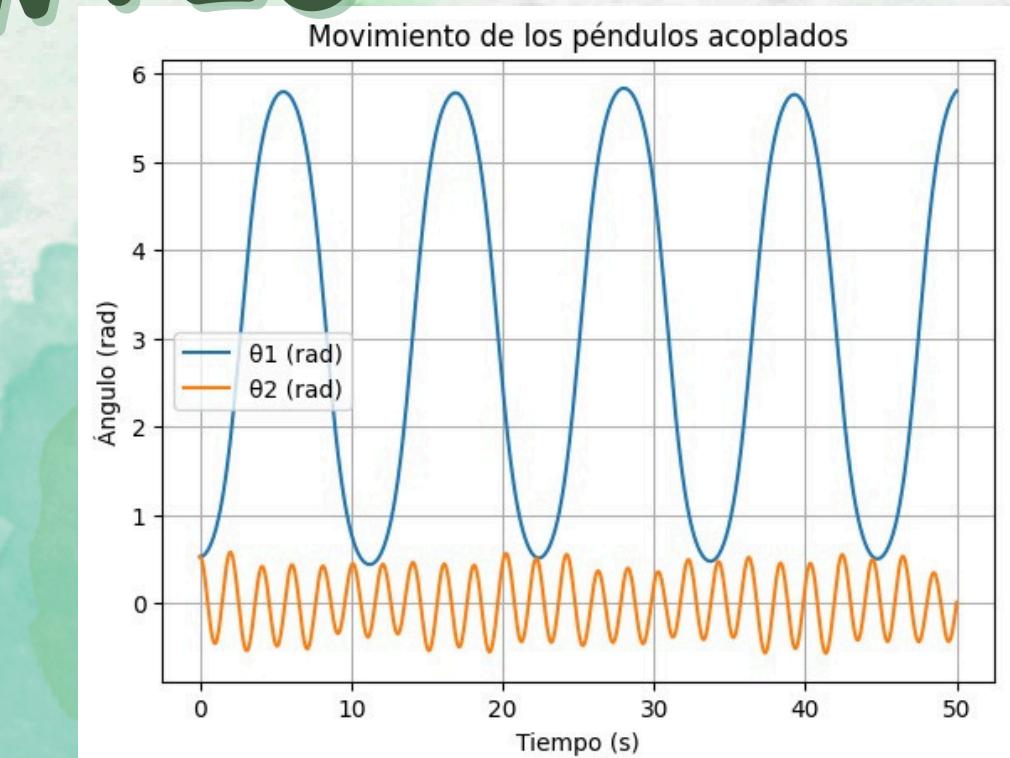
ESPECTROGRAMA DE FRECUENCIAS:



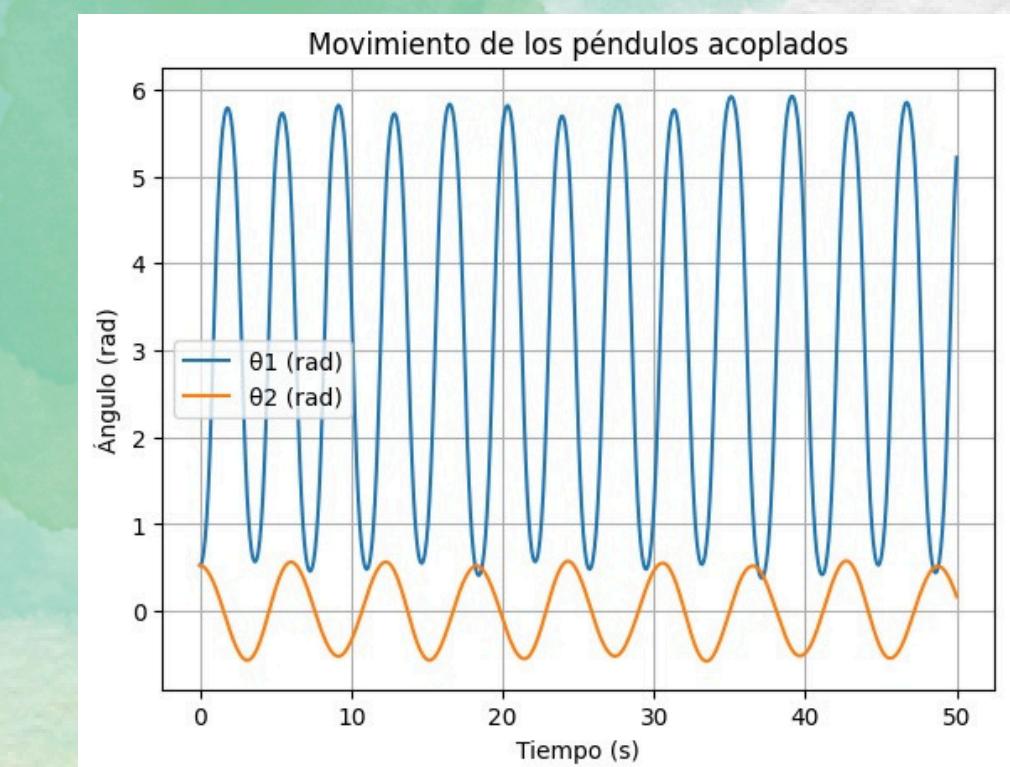
ANALISIS PARA LONGITUDES DIFERENTES:



1 m - 1m

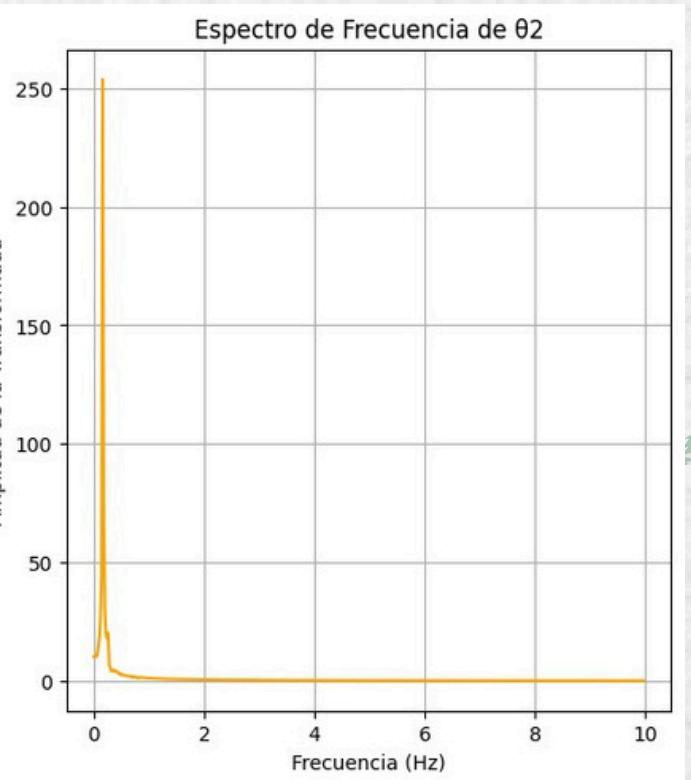
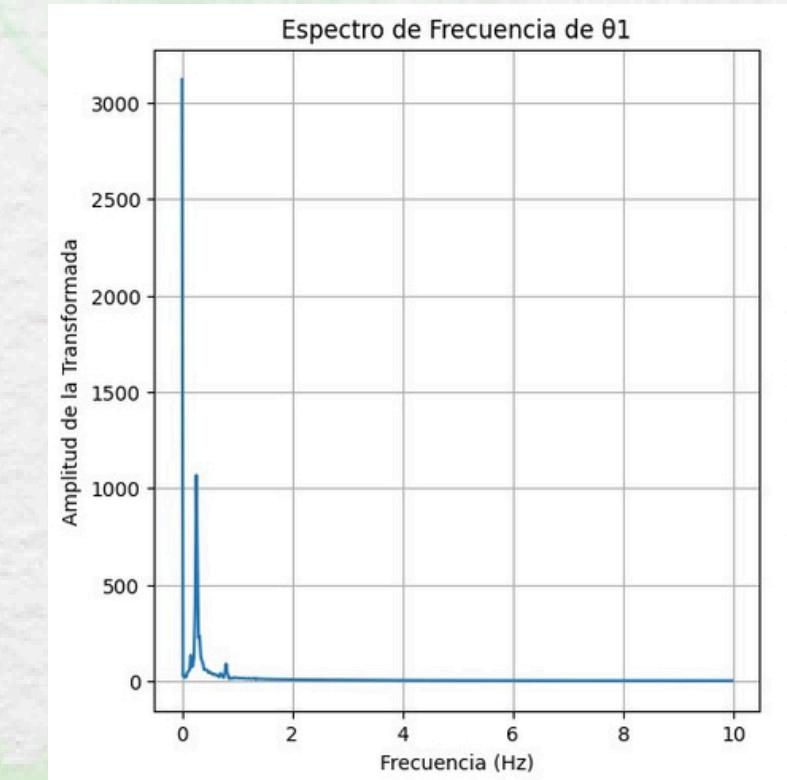
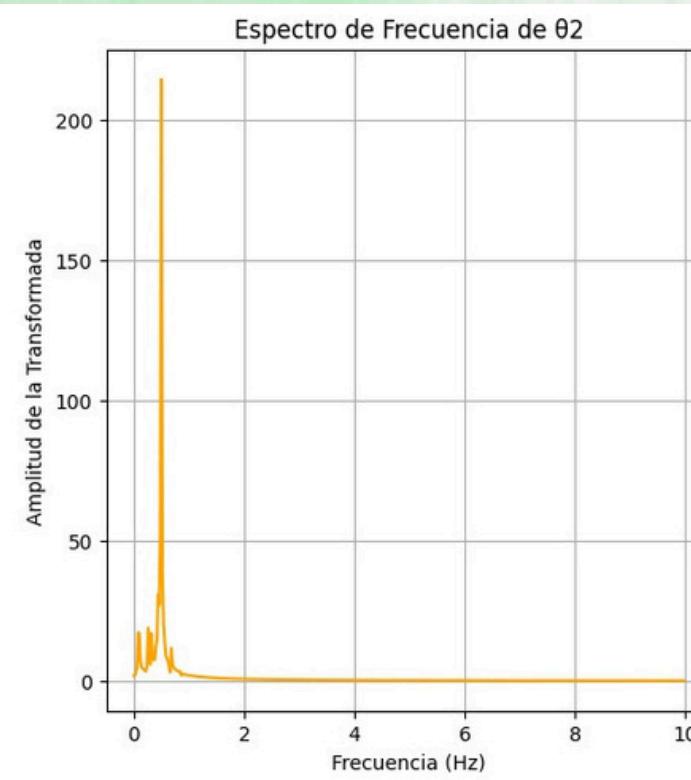
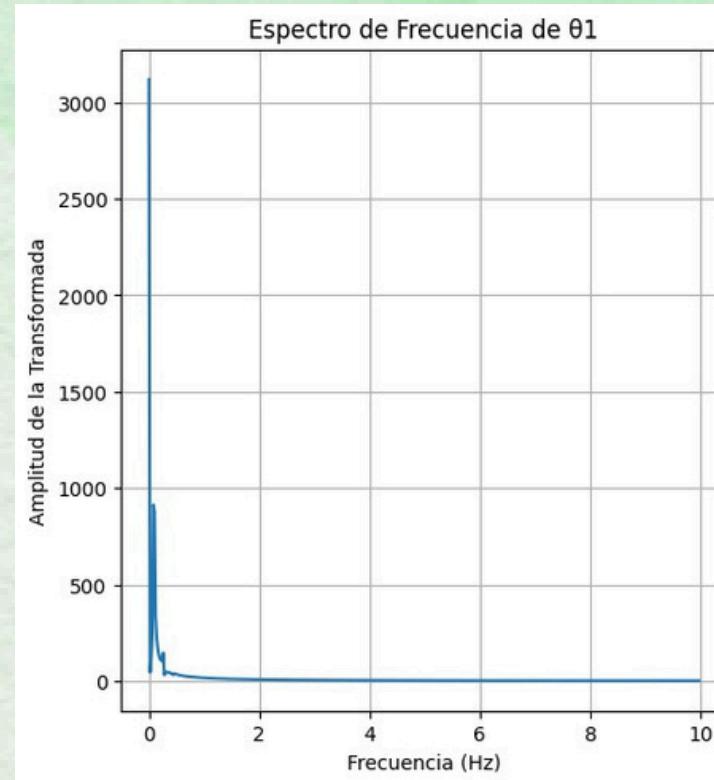


1 m - 3m

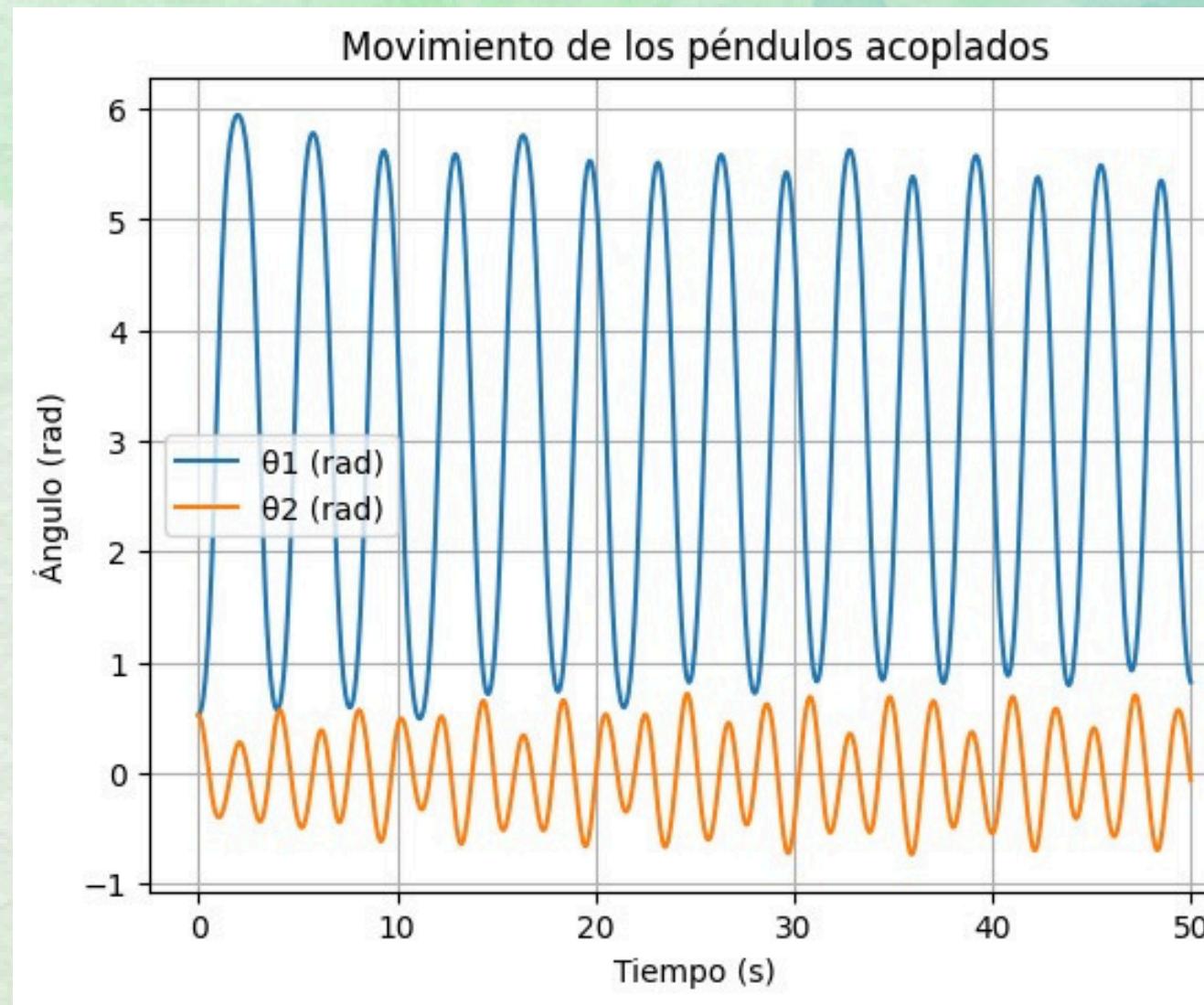


3m - 1m

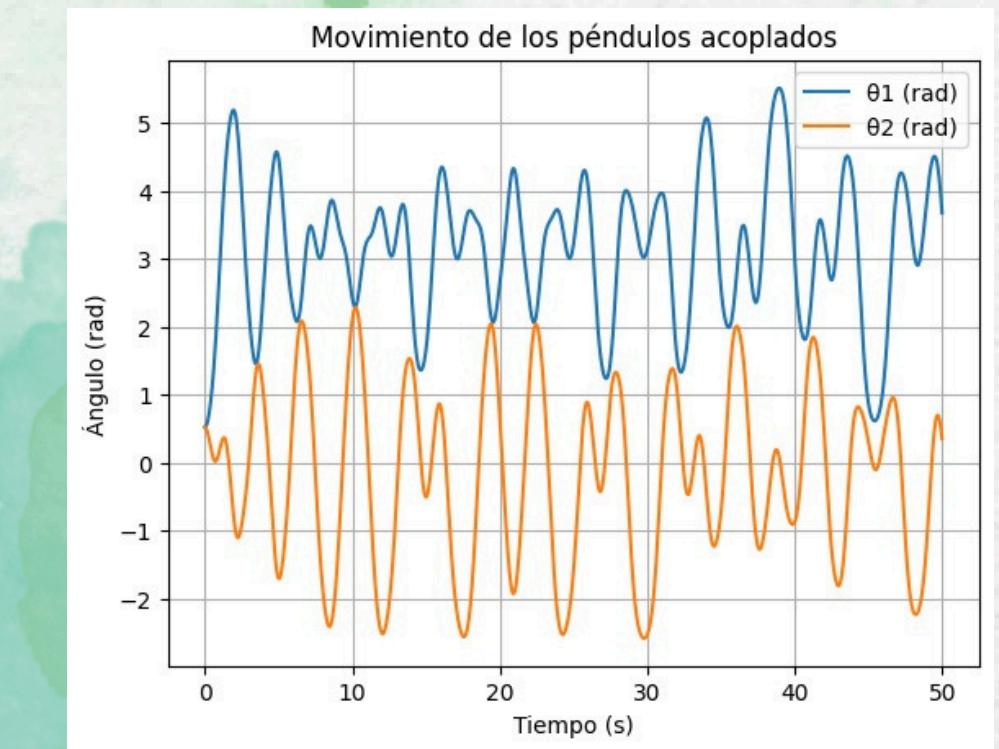
ESPECTROGRAMA DE FRECUENCIAS:



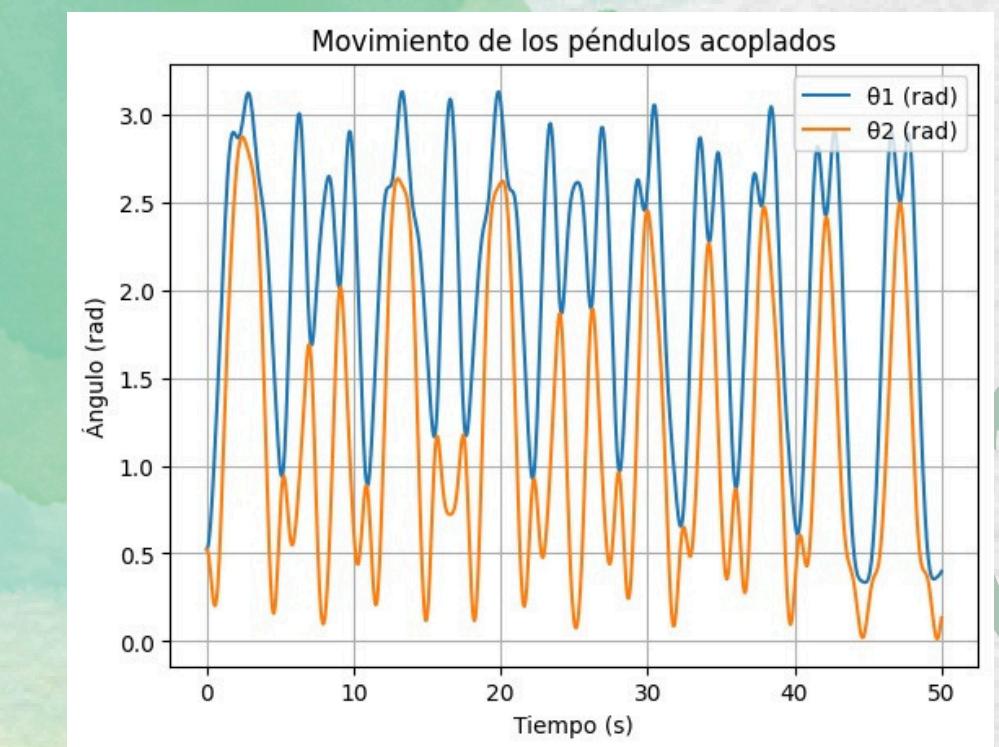
ANALISIS PARA K DIFERENTES:



1 N/m

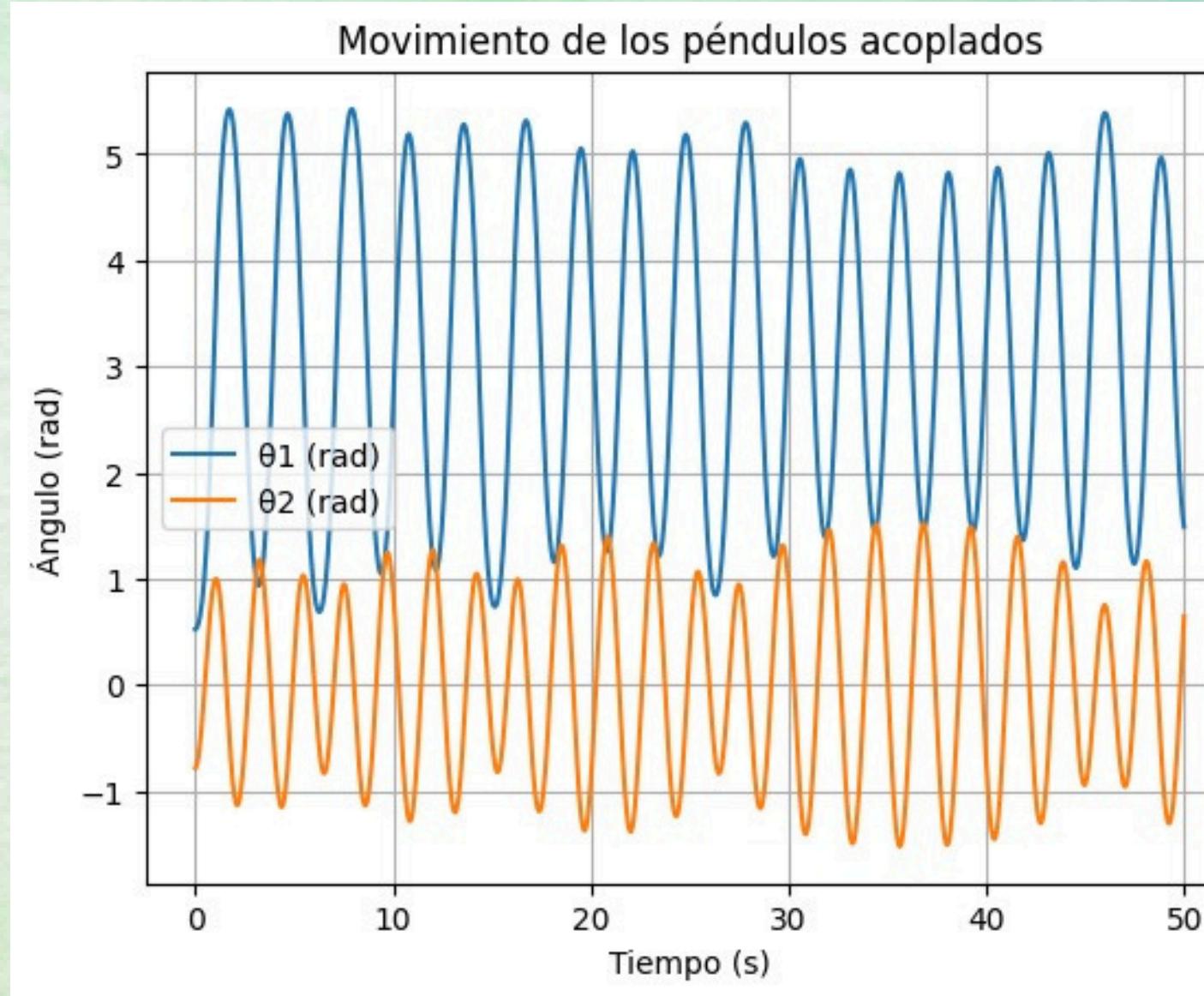


5 N/m

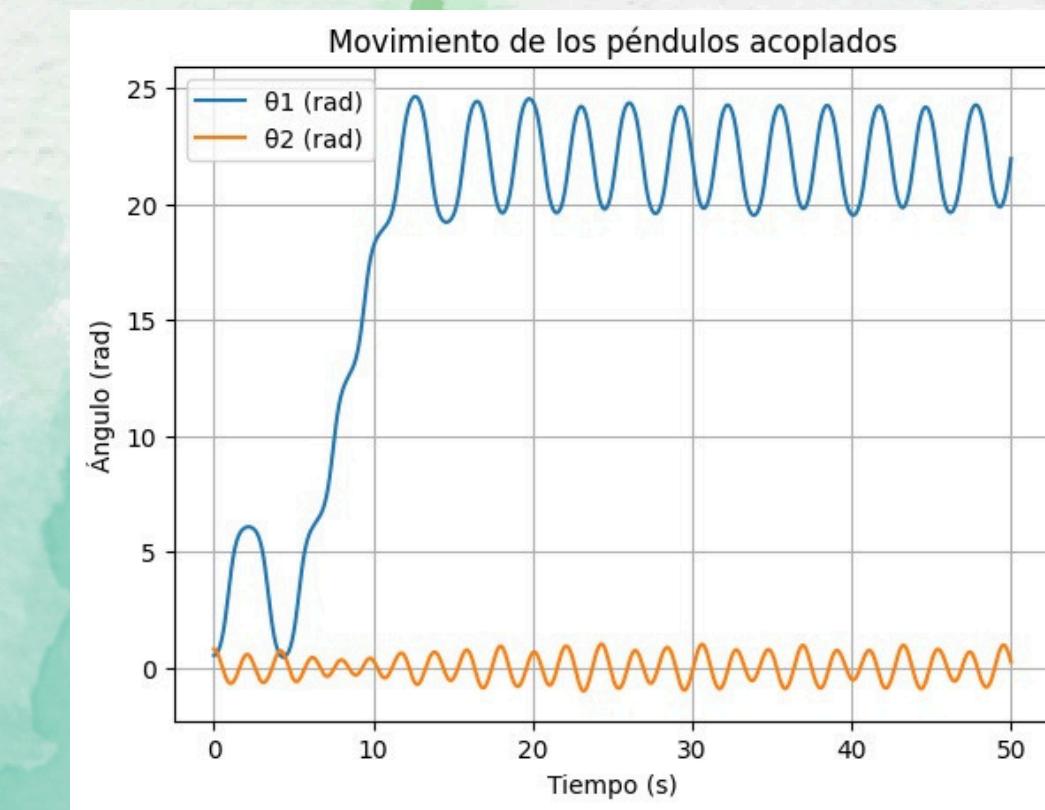


10 N/m

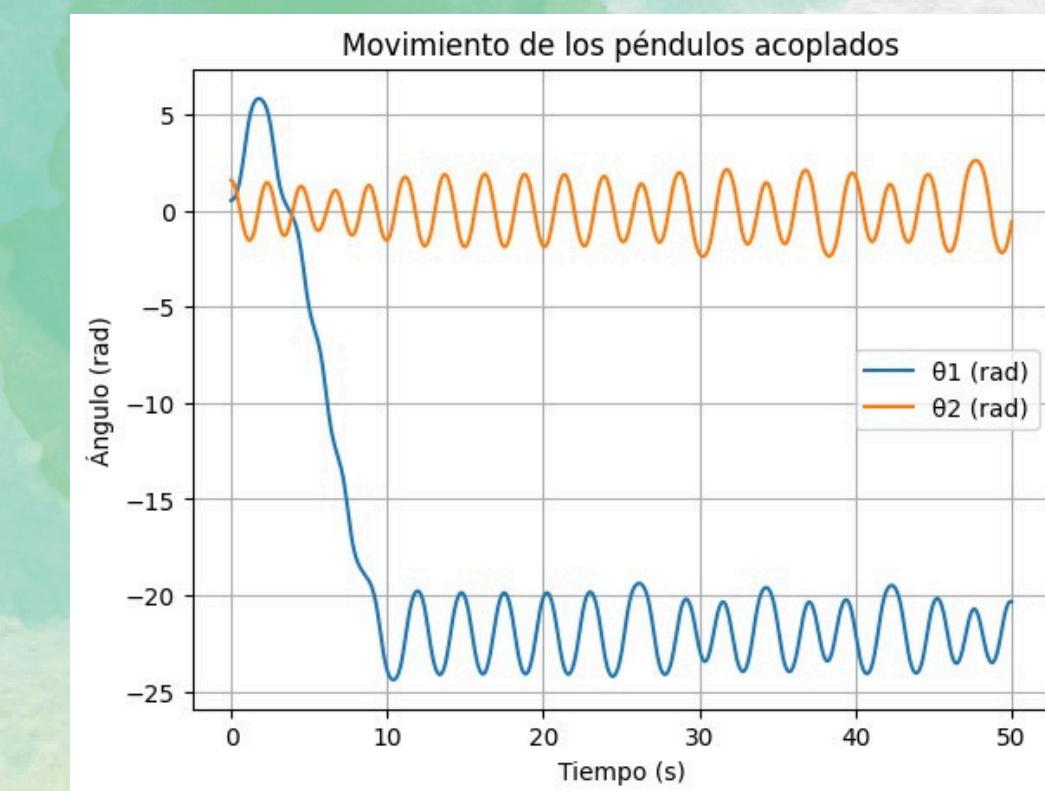
ANALISIS PARA ÁNGULOS DIFERENTES:



$\pi/6$; $-\pi/4$



$\pi/4$; $\pi/4$



$\pi/6$; $-\pi/2$

**GRACIAS
POR SU ATENCIÒN**