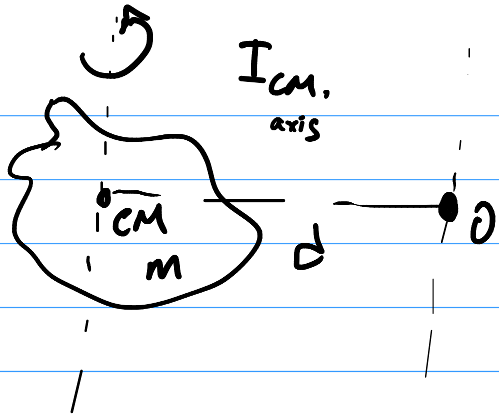
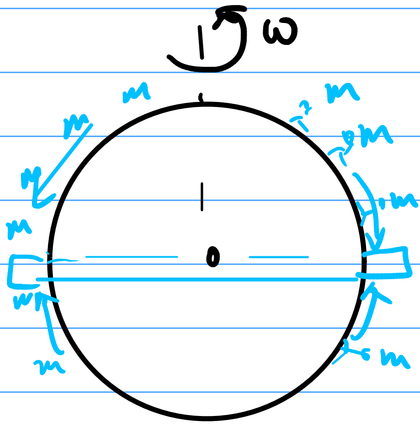


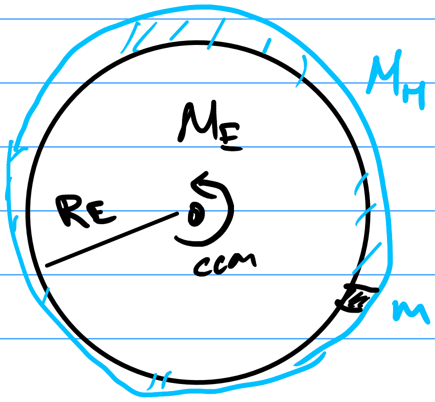
$$\boxed{I_0 = I_{cm} + m d^2}$$

Parallel axis theorem



$\vec{L}$ conserves $\qquad \vec{\tau}_{Ext} = 0$

$$\vec{L}_{Earth+humans} = \vec{L}_{Earth} + \vec{L}_{Humans}$$



$$I_{E+H} = I_E + I_H$$

$$= \frac{2}{5} M_E R_E^2 + \sum_H M_H r_E^2$$

$$= \frac{2}{5} M_E R_E^2 + M_H R_E^2$$

$$L_i = \cancel{I_E \omega_i} + \cancel{I_H \cdot \omega_i} = I_f$$

$$\cancel{I_E (\underset{\omega_i}{\omega_E} - \Delta\omega_E)} + I_H \cdot (\underset{\omega_i}{\cancel{\omega_i}} + \Delta\omega_H)$$

$$M_H = N \cdot m = 7 \cdot 10^9 \cdot 60_{kg} = 42 \cdot 10^{10}\ kg$$

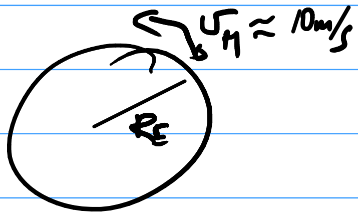
$$I_H = M_H \cdot \underset{6.4 \cdot 10^6}{R_E^2} = 42 \cdot 10^{10}_{kg} \cdot \underbrace{(6.4 \cdot 10^6_m)^2}_{44 \cdot 10^{12}} = 42 \cdot 44 \cdot 10^{22} \simeq 2000 \cdot 10^{22}$$

$$= 2 \cdot 10^{25}\ kg\ m^2$$

$$I_E = \frac{2}{5} M_E R_E^2 = \frac{2}{5} \cdot \cancel{6} \cdot 10^{24}_{kg} \cdot 44 \cdot 10^{12} = \underset{\approx 9}{88} \cdot 10^{36} = 9 \cdot 10^{37}$$

$$5 \approx \cancel{6}$$

$$0 = -I_E \, \Delta\omega_E + I_M \, \Delta\omega_M$$

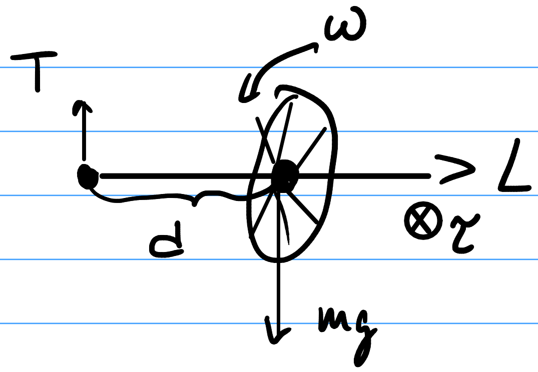


$$\Delta\omega_E = \frac{I_M}{I_E} \cdot \Delta\omega_M$$

$$= \frac{I_M}{I_E} \cdot \frac{\Delta v_M}{R_E}$$

$$= \frac{2 \cdot 10^{25}}{9 \cdot 10^{37}} \cdot \frac{10}{6.4 \cdot 10^{6}} = \frac{\overbrace{20}^{\approx 3}}{9 \cdot 6.4} \cdot \frac{10^{25}}{10^{37+6}}$$

$$= \frac{1}{3} \ldots = 0.3 \cdot 10^{(25-43)} = 0.3 \cdot 10^{-18}$$

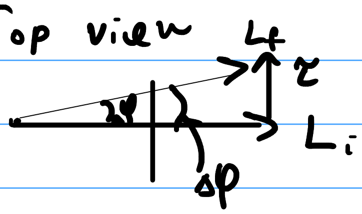


⊙ towards you

not used here

$$\frac{d\vec{L}}{dt} = \vec{\tau}_{EXt_O} = d\cdot mg\,\hat{\otimes} + 0$$

Top view



$$\Delta L = \vec{\tau}\,\Delta t$$

$$\vec{L}_f = \vec{L}_i + \Delta\vec{L} = \vec{L}_i + \vec{\tau}\cdot\Delta t$$

$$\Delta\varphi = \frac{\Delta L}{L} = \frac{\vec{\tau}\,\Delta t}{L}$$

$$\omega_p = \frac{\Delta\varphi}{\Delta t} = \frac{\tau\,\cancel{\Delta t}}{L\,\cancel{\Delta t}} = \frac{d\cdot mg}{I\cdot\omega}$$