

# 661-Problem 7 - § 3.2

$(\frac{\pi}{2} - \alpha)$  and  $\theta$  are polar and azimuthal angles of the c.m. respectively and denoting  $\{x, y, z\} = \vec{R}$  - coordinates of the c.m. find

$$\vec{R} = \{a \cos \alpha \cos \theta, a \cos \alpha \sin \theta, a \sin \alpha\}$$

$$\vec{V} = \dot{\vec{R}} = \{-a \cos \alpha \sin \theta \dot{\theta}, a \cos \alpha \cos \theta \dot{\theta}, 0\}$$

$$V = \sqrt{\vec{V} \cdot \vec{V}} = a \cos \alpha \dot{\theta}$$

On the other hand,  $V = z \Omega$  and

$$\Omega = \frac{V}{z} = \frac{a \cos \alpha \dot{\theta}}{a \sin \alpha} = \dot{\theta} \cot \alpha$$

$$\vec{\Omega} = \{\Omega \cos \theta, \Omega \sin \theta, 0\}$$

$$\vec{V} = \vec{\Omega} \times \vec{R}$$

please check!

the rest is trivial