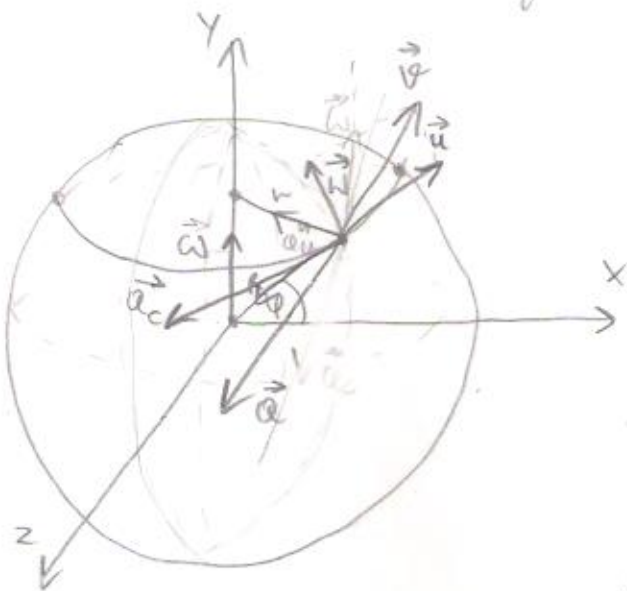
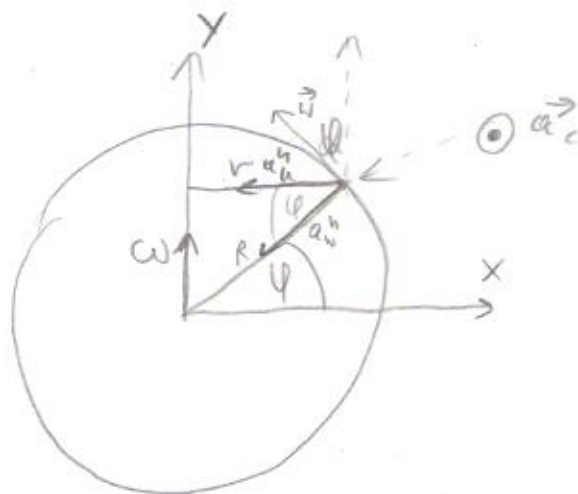


Sa modiol jedzie z Bielska z do Łeby.



Dane:
 R, ω, φ, W
 znaleźć:
 v, a



$$\frac{r}{R} = \cos \varphi \rightarrow r = R \cdot \cos \varphi$$

\vec{W} - prędkość wzdłuż osi
 \vec{u} - prędkość ukłosała

$$\vec{v} = \vec{W} + \vec{u} \quad u = \omega \cdot r$$

$$\vec{a}_c = 2 \vec{\omega} \times \vec{W}$$

$$|\vec{v}| = \sqrt{W^2 + u^2}$$

$$\vec{a} = \vec{a}_W + \vec{a}_u + \vec{a}_c$$

$$\vec{a}_W = \vec{a}_W^h + \vec{a}_W^t$$

$$a_u^h = \left(\frac{W}{R}\right)^2 \cdot R = \frac{W^2}{R} \quad a_W^t = 0$$

$$\vec{a}_u = \vec{a}_u^h + \vec{a}_u^t$$

$$a_u^h = \omega^2 \cdot r$$

$$\vec{a}_c = 2 \vec{\omega} \times \vec{W}$$

$$|\vec{a}_c| = 2 \omega \cdot W \cdot \sin \varphi (\vec{\omega} \perp \vec{W})$$

$$|\vec{a}_c| = 2 \omega \cdot W \sin \varphi$$

$$|\vec{a}| = \sqrt{a_W^h^2 + a_u^h^2 + a_c^2}$$

$$|\vec{a}| = \sqrt{\frac{W^4}{R^2} + \omega^4 \cdot r^2 + 4 \omega^2 \cdot W^2 \cdot \sin^2 \varphi}$$

