

Rigid body dynamics

- Coriolis acceleration

$$\vec{a}_p = \vec{a}_o + \frac{{}^b d^2}{dt^2} \vec{r} + 2\vec{\omega}_{ib} \times \frac{{}^b d}{dt} \vec{r} + \vec{\alpha}_{ib} \times \vec{r} + \vec{\omega}_{ib} \times (\vec{\omega}_{ib} \times \vec{r})$$

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$$\vec{a}_p = \vec{a}_o + \frac{{}^b d^2}{dt^2} \vec{r} + \boxed{2\vec{\omega}_{ib} \times \frac{{}^b d}{dt} \vec{r}} + \boxed{\vec{\alpha}_{ib} \times \vec{r}} + \boxed{\vec{\omega}_{ib} \times (\vec{\omega}_{ib} \times \vec{r})}$$

- Transversal acceleration

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$$\vec{a}_p = \vec{a}_o + \frac{{}^b d^2}{dt^2} \vec{r} + \underbrace{2\vec{\omega}_{ib} \times \frac{{}^b d}{dt} \vec{r}}_{\text{Coriolis acceleration}} + \underbrace{\vec{\alpha}_{ib} \times \vec{r}}_{\text{Transversal acceleration}} + \underbrace{\vec{\omega}_{ib} \times (\vec{\omega}_{ib} \times \vec{r})}_{\text{Centripetal acceleration}}$$

- Transversal acceleration

- Centripetal acceleration