

$$\begin{aligned}
 \frac{d}{dt} &= (\ddot{r} - r\dot{\phi}^2 \sin^2\theta - r\dot{\theta}^2) \hat{e}_r \\
 &+ (r\ddot{\theta} + 2\dot{r}\dot{\theta} - r\dot{\phi}^2 \sin\theta \cos\theta) \hat{e}_\theta \\
 &+ (r\dot{\phi} \sin\theta + 2\dot{r}\dot{\phi} \sin\theta + 2r\dot{\theta}\dot{\phi} \cos\theta) \hat{e}_\phi
 \end{aligned}$$