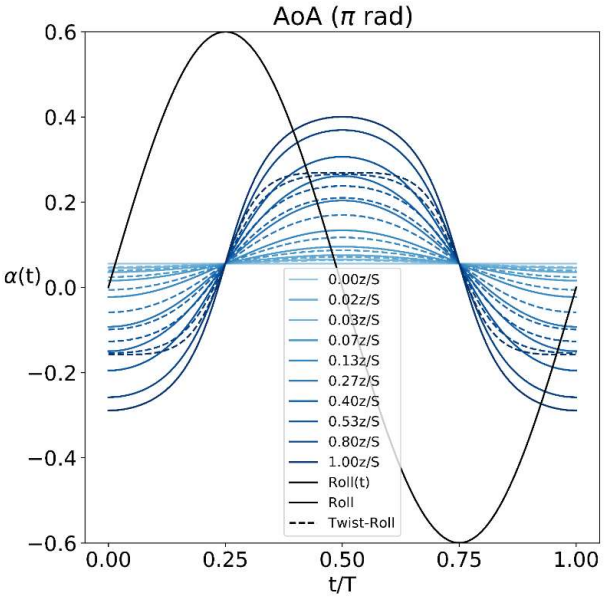
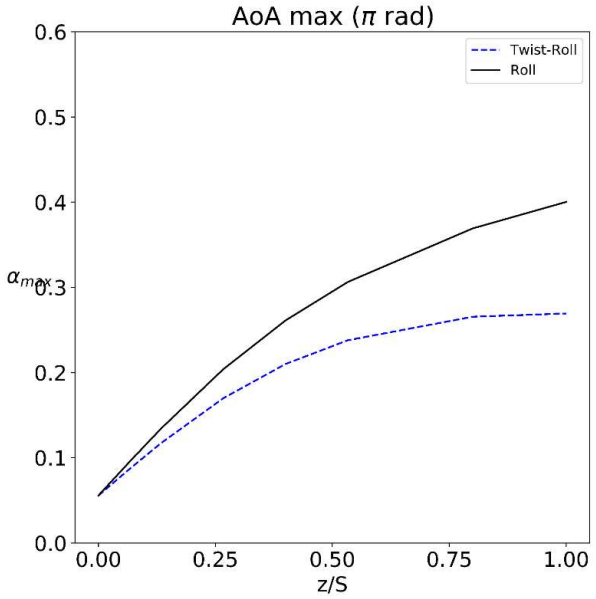
AoA (sectional)

*Triantafyllou et al. 'Review of Experimental Work in Biomimetic Foils'

$$*\tan(\alpha(t) + \theta(t)) = (dh/dt)/U$$





Heave

$$\alpha(t) = \frac{-\left(\tan^{-1}\left(2\pi f A \cos(2\pi f t)\right) - \frac{\pi}{18}\right)}{\pi}$$

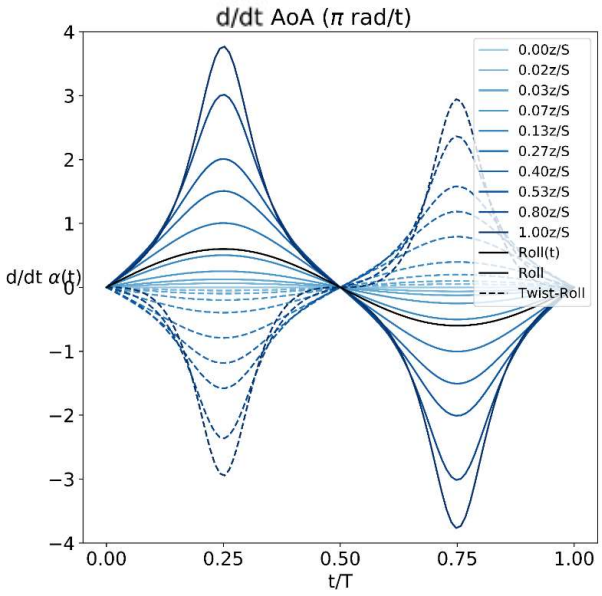
($\dot{H}(t)$, θ_{bias})

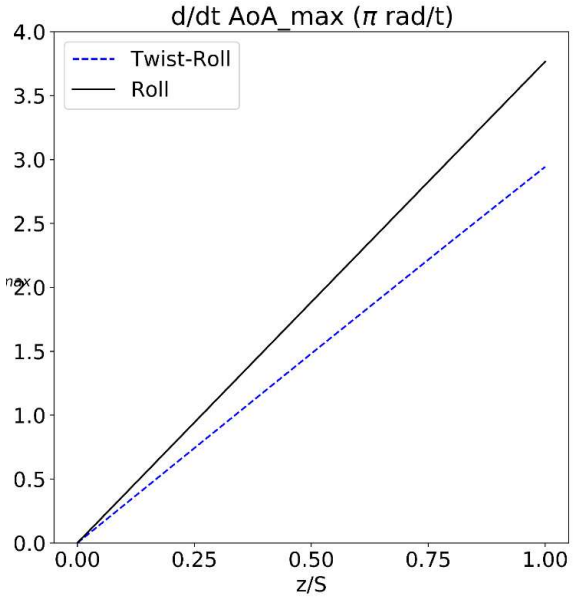
Heave+Pitch

$$\alpha(t) = -\frac{\left(\tan^{-1}\left(2\pi f A \cos(2\pi f t)\right) - p\cos(2\pi f t) - \frac{\pi}{18}\right)}{\pi}$$

($\dot{H}(t)$, $\theta(t)$, θ_{bias})

d/dt (AoA)





Heave

$$\frac{d}{dt}\alpha(t) = \frac{\left(4\pi^2 \cdot A \cdot f^2 \cdot \frac{\sin(2\pi f t)}{4\pi^2 \cdot A^2 \cdot f^2 \cdot \cos^2(2\pi f t)+1}\right)}{\pi}$$

Heave+Pitch

$$\frac{d}{dt}\alpha(t) = -\frac{\left(p - \frac{2\pi f A}{4\pi^2 \cdot A^2 \cdot f^2 \cdot \cos^2(2\pi f t)+1}\right)2\pi f \sin(2\pi f t)}{\pi}$$