Numerical investigation into the choice of gait parameters in 2D anguilliform swimmers

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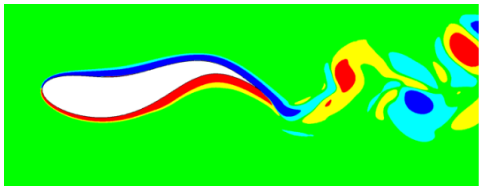
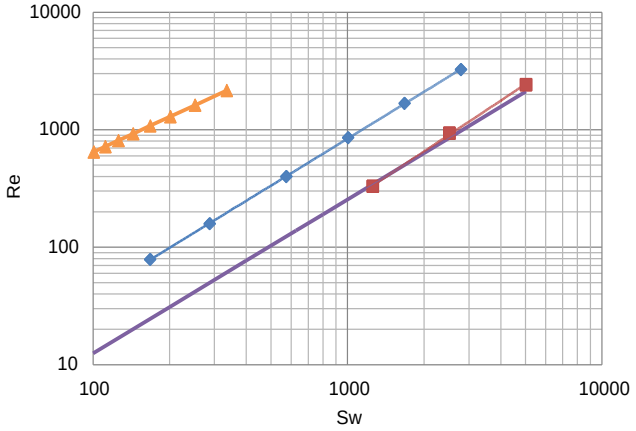
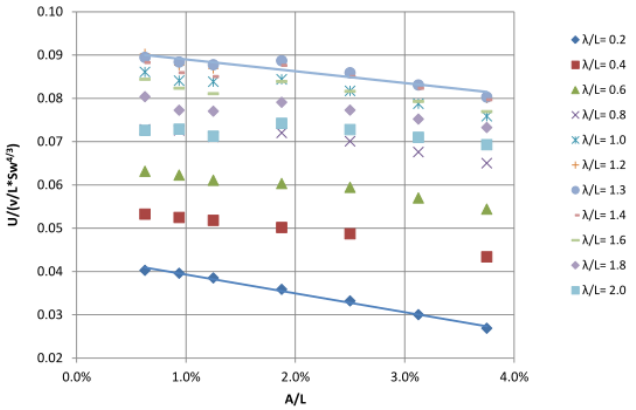
- Swimmers exhibit a range of body lengths, L, swimming frequency, ω and tail beat amplitude, A
- A scaling law of $Re \sim Sw^{4/3}$ where $Sw = LA\omega/\nu$ is observed for the laminar regime
- Anguilliform swimming studied numerically in the laminar regime with two approaches to replicate Re –Sw relation
- Varied tail amplitude and wavelength varied



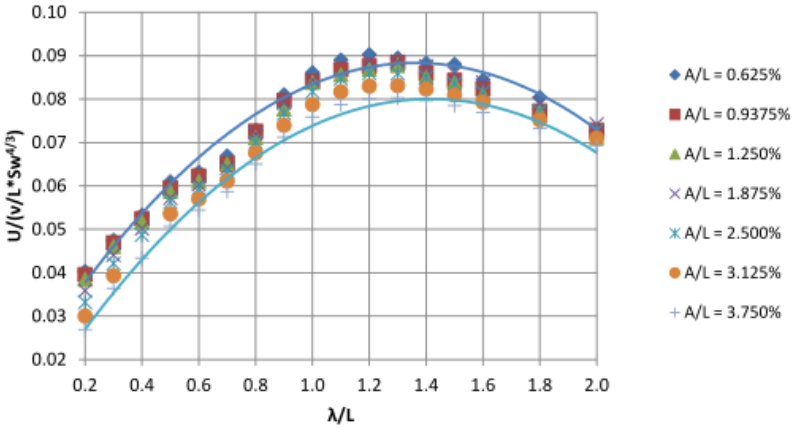
- Re-Sw relation replicated when Blasius boundary layer force added to panel method
- RANS somewhat over predicts power while neglecting viscous drag leads to a linear Re-Sw relation as seen for the turbulent regime
- Normalized velocity decreases linearly with increased tail amplitude → additional speed is being achieved less efficiently
- A peak in normalized velocity is found for wavelengths around 1.3 L



Swimming number versus Reynolds number in laminar regime



Influence of tail amplitude on normalized velocity



Influence of wavelength on normalized velocity