

Abstract Submitted  
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**A note on a swirling squirmer in a shear-thinning fluid**<sup>1</sup> KEXIN ZHENG, Santa Clara University, HERVE NGANGUIA, Indiana University of Pennsylvania, YE CHEN, ON SHUN PAK, Santa Clara University, LAILAI ZHU, National University of Singapore — A recent study has revealed that a squirmer with swirl in a viscoelastic fluid can lead to a significant speed enhancement (Binagia *et al.*, *J. Fluid Mech.*, 900, A4, 2020). Here we consider a similar calculation but focus on the effect of shear-thinning viscosity, which is another common non-Newtonian rheology of biological fluids such as blood and mucus. We employ the Carreau constitutive equation to examine how the swirling flow affects the swimming of a squirmer in a shear-thinning but inelastic fluid. The results will allow us to better separate the impacts due to viscoelasticity and shear-thinning rheology, and evaluate their relative importance in the observed phenomenon.

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