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**Signatures of elastoviscous buckling in the dilute rheology of stiff polymers** BRATO CHAKRABARTI, Center for Computational Biology, Flatiron Institute, YANAN LIU, School of Physics, Northwest University, Xian, China, OLIVIA DU ROURE, ANKE LINDNER, ESPCI Paris, DAVID SAINTILLAN, Department of Mechanical and Aerospace Engineering, Univeristy of California, San Diego — As an elastic polymer tumbles in shear flow, it experiences compressive viscous forces that can cause it to buckle and undergo a sequence of morphological transitions with increasing flow strength. We use numerical simulations to uncover the effects of these transitions on the steady shear rheology of a dilute suspension of stiff polymers. Our results agree with classic scalings for Brownian rods in relatively weak flows but depart from them above the buckling threshold. These changes in scaling laws are further highlighted in the gyration tensor of the polymer that allows us to quantify the role of filament morphologies in rheology. Signatures of elastoviscous buckling include enhanced shear thinning and an increase in the magnitude of normal stress differences that. We discuss our findings in the light of past work on rigid rods and non-Brownian filaments and highlight the subtle role of thermal fluctuations in triggering instabilities

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