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Kinematics of a Sphere Moving through a Yield Stress Liquid
STEPHEN BUCH, PIOTR HABDAS, Saint Joseph's University — We measure the drag force exerted on spheres with different diameters (d) being pulled at constant speed through a suspension of Carbopol polymer in water in tubes of various diameters (D). We find that the drag force increases with sphere speed over the range of velocities studied. The drag force also increases with decreasing tube size for $D/d < 2$. Thus, we can estimate the size of the envelope of sheared liquid that surrounds the moving sphere. Interestingly, we find that the envelope size does not depend on the sphere velocity.

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