Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

**Flow of a viscous nematic fluid around a microsphere** MANUEL GOMEZ-GONZALEZ, JUAN C. DEL ALAMO, University of California, San Diego

— We analyze the creeping flow elicited by a rigid spherical particle in a viscous nematic fluid. The drag force acting on the particle and its far flow velocity field are obtained in closed analytical form. We identify two anisotropy mechanisms arising from the constitutive equations, namely, the anisotropic momentum diffusivity and the resistance to bending of the fluid. Their influence on the flow is studied separately by defining two "pure" pseudo-isotropic conditions in which only one of these mechanisms is present. The accuracy of existing Particle Tracking Microrheology methods is analyzed in these fluids, with especial attention to an approach that provides effective directional viscosity coefficients by applying Stokes's drag separately along different directions. Finally, we analyze the effect of anisotropy on the flow structure, finding that directional momentum diffusivity produces asymmetric streamline patterns with enhanced streamline deflection in the directions of lower diffusivity and viceversa. This asymmetry can either be increased or decreased by the bending resistance of the fluid, depending on the sign of the bending stresses. In some cases, their combined effect is found to produce streamline patterns that converge towards the sphere.

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Date submitted: 03 Aug 2012

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