Dynamics of nematic liquid crystal polymers in coupled flow and magnetic field QI WANG, Florida State University, M.G. FOREST, UNC-Chapel Hill, RUHAI ZHOU, Old Dominion University, HONG ZHOU, Naval Postgraduate School, SARTHOK SIRCAR, Florida State University — We study the hydrodynamics of the nematic liquid crystals in coupled flow and magnetic field. We focus on two prototypes of the idealized flow geometries: general linear planar flows and elongational flows. For both flows, we give a complete flow phase diagram for all flow strength and the strength of the imposed magnetic field. For the elongational flows, we show rigorously that the magnetic field must coincide with one of the principle axes of the second moment of the probability density function for the distribution of the nematic polymers.

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