Dynamics and Instabilities of an overdamped active nematic liquid crystal\textsuperscript{1} ELIAS PUTZIG, APARNA BASKARAN, Brandeis University — Active nematics have been studied extensively in the context of suspensions of active particles, with a Stokes equation describing the flow of the surrounding fluid. Here we will present a continuum model of an overdamped (often termed 'dry') active nematic, where activity enters through self-induced flows. These flows represent the ability of the internal forces to convect, shear, or rotate the nematic order. The self-induced shear gives rise to an instability in the homogeneous ordered state which is analogous to that seen in active suspensions. The self-induced rotation gives rise to a new instability. A phase diagram from this model will be presented, and the phenomenology will be compared with what is seen in experimental and simulated active systems.

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