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Defect Proliferation in Active Nematic Suspensions[1] PRASHANT MISHRA, MARK J. BOWICK, Physics Dpt, Syracuse University, LUCA GIOMI, SISSA, Italy, M. CRISTINA MARCHETTI, Physics Dpt, Syracuse University — The rich structure of equilibrium nematic suspensions, with their characteristic disclination defects, is modified when active forces come into play. The uniform nematic state is known to be unstable to splay (extensile) or bend (contractile) deformations above a critical activity. At even higher activity the flow becomes oscillatory and eventually turbulent. Using hydrodynamics, we classify the active flow regimes as functions of activity and order parameter friction for both contractile and extensile systems. The turbulent regime is marked by a non-zero steady state density of mobile defect pairs. The defect density itself scales with an "active Ericksen number," defined as the ratio of the rate at which activity is injected into the system to the relaxation rate of orientational deformations.

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