

Abstract Submitted
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Field activated alignment and bifurcations in rigid rod suspensions ARVIND GOPINATH¹, SARAH BATES², ANETTE HOSOI³, MIT — Weak fields tend to align hard rod suspensions and trigger bifurcations from steady to periodic states. Three canonical problems are studied to thresh out common dynamical characteristics - the effect of weak shear, intrinsic aligning capabilities due to paramagnetic effects and externally imposed alignment via active orienting motors that adhere to the rods. The focus is on the relationships between new bifurcating solutions and the symmetries broken in the process of emergence. Imposition of weakly non-equilibrium shear flow can result in global bifurcations that are not discernable by a linear stability analysis while destabilization due to effects of polarity are seen to yield local bifurcations. Our exact results are corroborated by detailed asymptotic studies and extend previously obtained results.

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