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**Coarsening Dynamics of Actively Rotating Binary Liquids** SYEDA SABRINA, KYLE J.M. BISHOP, Penn State University — Active matter comprised of many self-driven units (*e.g.* colloidal swimmers) exhibit emergent behaviors such as clustering and swarming depending on the nature of local energy input and the interactions between individual units. A recent study showed that binary mixtures of actively rotating particles phase separate by spinodal decomposition. Other more exotic types of coarsening dynamics are anticipated in this nonequilibrium system. Here we develop a continuum model of phase separation in actively rotating binary liquids and investigate the role of active rotation, frictional damping and viscous coupling on the system's macroscopic dynamics. The model combines the convective Cahn-Hilliard equation and the Stokes equation with active rotation governing local composition and velocity field respectively. Besides reproducing previous results under *weak rotation* ($Pe < 1$), our model predicts a rich phase behavior of the system in different dynamical regimes such as drag dominant ($\beta \gg 1$) and viscous hydrodynamic ($\beta \ll 1$) regimes. Numerical results along with scaling arguments elucidate diverse behaviors under both *weak* and *strong rotation* ($Pe > 1$) as well as emergence of *active doublets*.

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