

Dynamics of active nematic defects on cones

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Cones with orientational order in the local tangent plane provide a soft matter analog of the Aharonov-Bohm effect. We investigate the dynamics of a compressible active nematic on a cone. Imposing strong anchoring boundary conditions at the base gives rise to a rich phase diagram of periodic orbits of one or two $+1/2$ flank defects, with transitions between these states mediated by defect absorption, defect unbinding, or defect pair nucleation at the apex. Numerical simulations confirm theoretical predictions of not only the nature of the circular orbits but also defect unbinding from the apex.

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