Abstract Submitted
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Defects in an active nematic confined to a toroid[1] PERRY ELLIS, Georgia Institute of Technology, DAN PEARCE, LUCA GIOMI, Universiteit Leiden, ALBERTO FERNANDEZ-NIEVES, Georgia Institute of Technology — Active materials are driven far from the ground state by the motion of their constituent particles, thereby making them inherently non-equilibrium materials. For an active nematic, this results in a continuous creation and annihilation of $\pm 1/2$ defect pairs. Here, we confine an active nematic to the surface of a toroid and show that the topological charge of the defects couples to the Gaussian curvature of the underlying surface. However, in our experiments this defect unbinding happens on average, illustrating that despite subtle differences, the role of activity is reminiscent of the role of temperature in conventional nematics. This is confirmed by computer simulations which clearly illustrate that defect unbinding depends on activity. Overall, our results illustrate the role of confinement and curvature on the defect behavior of active nematic liquid crystals.

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