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Active nemato-hydrodynamics in toroidal microchannels RICHARD GREEN, Instituut-Lorentz, Leiden University, JOHN TONER, Department of Physics and Institute of Theoretical Science, University of Oregon, VINCENZO VITELLI, Instituut-Lorentz, Leiden University — We investigate flow driven by activity in nematic and polar fluids confined in a toroidal geometry. Using a perturbative expansion in the activity strength, we obtain closed form analytic solutions for the activity-driven flow. A distinguishing feature of this system is that there is no critical threshold which the activity needs to overcome in order to initiate the flow; rather, the flow is a consequence of the combination of activity and curved geometry at any non-zero activity, however small.

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