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Necklaces of Liquid Crystal Beads: Nematic Drops Constrained on Thin Cellulosic Fibers PEDRO ALMEIDA, YONG GENG, FCT/UNL, EUGENE TERENTJEV, University of Cambridge, MARIA HELENA GODINHO, FCT/UNL, CENIMAT COLLABORATION, CAVENDISH LABORATORY COLLABORATION — Liquid crystal droplets dispersed in a continuous matrix have important applications in electro-optical devices. They also produce intriguing topological defect structures due to the confinement of the liquid crystal by closed boundaries that impose alignment at the interface. In this work we use a simple method to generate stable liquid crystal droplets topologically equivalent to a toroid by depositing tiny volumes of a nematic liquid on cellulosic micro-fibers (1 μm diameter) suspended in air. This system can exhibit non-trivial point topological defects which can be energetically unstable against expanding into ring defects, depending on the fibers constraining geometries. By changing temperature, the system remains stable and allows the study of the defects evolution near the nematic-isotropic transition showing qualitatively different behavior on cooling and heating processes. The necklaces of such liquid crystal drops constitute excellent systems for fundamental studies and open new perspectives for applications. This work was sponsored by Air Force Office of Scientific Research, Air Force Material Command, USAF, under grant number FA8655-10-1-3020. The US Government is authorized to reproduce and distribute reprints for Governmental purpose notwithstanding any copyright notation thereon. Other support includes the Portuguese Science and Technology Foundation grant SFRH/BD/63574/2009 and projects PEst-C/CTM/LA0025/2011 (Strategic Project - LA 25 - 2011-2012, PTDC/CTM/099595/2008, PTDC/FIS/110132/2009 and Windsor Treaty grant 2009-10 UR55.

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