Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

A study on the twisted-escape radial configuration of lyotropic chromonic liquid crystals confined to cylinders RUI CHANG, KARTHIK NAYANI, JINXIN FU, NILS PERSSON, ELSA REICHMANIS, JUNG OK PARK, MOHAN SRINIVASARAO, Georgia Institute of Technology — Nematic liquid crystals commonly exhibit escape radial configuration when confined to cylinders with normal surface anchoring. Lyotropic chromonic liquid crystals confined to cylinders exhibit a departure from the escape radial configuration by developing a twist distortion. This symmetry-breaking configuration is distinguished by its birefringence pattern with an increase of the transmitted intensity in the center of the cylinder. The length distribution and the average length of chromonic aggregates were estimated from a model for self-assembling systems. The contrasting scaling of splay and bend elastic modulus with aggregation length leads to the changes in the director field and the birefringence pattern. For high concentrations, we observed a co-existence of the twisted escape radial configuration with the doubly twisted configuration. The anchoring violation in doubly twisted domains is rationalized by the weak anchoring strength which is overcome by means of the saddle splay contribution to the free energy. Our experiments enable the estimation of the normal anchoring strength with the help of numerical calculations.

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Date submitted: 11 Nov 2016 Electronic form version 1.4