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Dynamics of Director Fluctuations in Confined and Filled Liquid Crystals. EDWIN ARROYO, SARMISTHA BASU, FOUAD ALIEV, University of Puerto Rico — Dynamic light scattering was applied to study the influence of randomness as well of boundary conditions (planar-axial and homeotropic-radial) and layer thickness (at nanoscale) of 5CB and 8CB confined to random porous matrices, to cylindrical pores and filled with Aerosil particles (hydrophilic and hydrophobic) on phase transitions and relaxation of director orientational fluctuations. For confined 8CB in the nematic phase two well-defined relaxation processes were for confined liquid crystals. The first process is associated with bulk-like nematic director fluctuations. The second relaxation process (with relaxation time slower than the first one) is most likely due to the fluctuations in layers nearest the wall surface. We found that for homeotropic boundary conditions of confined liquid crystal, the pore wall-liquid crystal interactions influence on the properties of the surface layer is stronger than in the case of axial orientation, particularly, and the influence of boundary conditions on N-Sm-A phase transition in confined 8CB is stronger than on isotropic- nematic phase transition. The separation between the first and the second (slow) process is clearer for thinner layers and the amplitude of slow process is greater for thinner layers. This suggests that the slow process is surface related relaxation. This relaxation was observed in filled liquid crystals as well.

Fouad Aliev
University of Puerto Rico

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