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Smectic Liquid Crystals in the Immediate Vicinity of the Superstructure of a Nanoparticle in a Nanocomposite[1] LUZ J. MARTINEZ-MIRANDA, University of Maryland, College Park, MD — We have studied how the nanoparticle (or the superstructure the nanoparticle forms) aligns the liquid crystal in smectic liquid crystal nanocomposites to determine how charges are transferred between the liquid crystal and the nanoparticle or nanoparticle superstructure [1,2,3]. This superstructure depends on the density of aliphatic functionalizations at the surface of the nanoparticle [4]. We have found evidence that the asymmetry of the liquid crystal distorts those superstructures that belong to the cubic structure. In addition, we have observed some differences in how the smectic liquid crystal behaves depending on the nanoparticle used and how the liquid crystal is aligned by the substrate. Knowing how the smectic liquid crystals align in the immediate vicinity of this superstructure with respect to the bulk alignment gives us an idea of how charges are transferred.

[1] Taylor, J. W. Ph. D. Thesis. University of Maryland, College Park, USA, 2013.
[2] Martinez-Miranda, L. J. et al, *Applied Physics Letters* 2010, 97, 223301.
[3] Branch, J. et al , *Journal of Applied Physics* 2014, 115, 164303.
[4] See, for example, Draper, M. et al, *Advanced Functional Materials* 2011, 21, 1260-1278.

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