

Abstract Submitted  
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**Liquid Crystal-ZnO Nanoparticle Potential Photovoltaics: Role of LC Order and ZnO Particle Size and Concentration**<sup>1</sup> LUZ J. MARTINEZ-MIRANDA, JANELLE BRANCH<sup>2</sup>, ROBERT THOMPSON, JEFFERSON W. TAYLOR, LOURDES SALAMANCA-RIBA, University of Maryland — We investigate the role order plays in the transfer of charges in ZnO nanoparticle - 8CB liquid crystal system for photovoltaic applications as well as the role the nominally  $5 \times 7 \text{ nm}^2$  ZnO nanoparticles play in improving that order. Our results for the 5nm nanoparticles show an improvement in the alignment of the liquid crystal with increasing weight percentage of ZnO nanoparticles, up to a concentration of 30% wt for the 5nm particles accompanied by an increase by three orders of magnitude in the current generated.<sup>3</sup> Our results for the  $5 \times 7 \text{ nm}^2$  sample show that the current is larger than the current obtained for the 5 nm samples. The photocurrent can be expressed as the conductivity as a function dependent in the order in the sample times the portion of the electric field that is absorbed and transformed into the current.

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<sup>3</sup>L. J. Martínez-Miranda, Kaitlin M. Traister, Iriselies Meléndez-Rodríguez, and Lourdes Salamanca-Riba, Appl. Phys. Letts, 97, in press (2010).

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