Abstract Submitted
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Photonic Crystal Geometry for Organic Solar Cells[1] EDWARD SAMULSKI, RENE LOPEZ, DOO-HYUN KO, JOHN TUMBLESTON, University of North Carolina — Efficient absorption of light calls for thicker PV active layers whereas carrier transport always benefits from thinner ones, and this dichotomy is at the heart of an efficiency/cost conundrum that has kept solar energy expensive relative to fossil fuels. We report a 2-D, photonic crystal morphology that enhances the efficiency of organic photovoltaic cells relative to conventional planar cells.[1] The morphology is developed by patterning an organic photoactive bulk heterojunction blend using PRINT a process that lends itself to large area fabrication of nanostructures.[2] The photonic crystal cell morphology increases photocurrents generally, and particularly through the excitation of resonant modes near the band edge of the organic PV material. [1] Ko, D.-H.; Tumbleston, J. R.; Zhang, L.; Williams, S.; DeSimone, J. M.; Rene, L.; Samulski, E. T. *Nano Lett.* **2009**, 9, 2742–2746. [2] Hampton et al. *Adv. Mater.* **2008**, 20, 2667.

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