Abstract Submitted
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Liquid crystal cells with "dirty" substrates[1] QUAN ZHANG, LEO RADZIHOVSKY, Department of Physics, University of Colorado, Boulder, CO 80309 — We explore liquid crystal order in a cell with a "dirty" substrate imposing a random surface pinning. Modeling such systems by a random-field xy-model with *surface* heterogeneity, we find that orientational order in the three-dimensional system is marginally unstable to such surface pinning. We compute the Larkin length scale, and the corresponding surface and bulk distortions. On longer scales we calculate correlation functions using the functional renormalization group and matching methods, finding a universal logarithmic and double-logarithmic roughness in two and three dimensions, respectively. For a finite thickness cell, we explore the interplay of homogeneous-heterogeneous substrate pair and detail crossovers as a function of disorder strength and cell thickness.

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