Abstract Submitted
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8CB-Langmuir Layer at air/water interface: Line Tension vs. Dipolar Repulsion PRITAM MANDAL, Dept. of Physics, Kent State University, Kent, OH 44242, ANDREW BERNOFF, Dept. of Mathematics, Harvey Mudd College, Claremont, CA 91711, ADIN MANN, Dept.of Chemical Engineering, Case Western Reserve University, Cleveland, OH 44106, JAMES ALEXANDER, Dept. of Mathematics, Case Western Reserve University, Cleveland, OH 44106, ELIZABETH MANN, Dept. of Physics, Kent State University, Kent, OH 44242 — Langmuir films of 8CB, a smectic liquid crystal at room temperature, exhibits coexistence of phases with different thicknesses. With decompression of a 8CB-liquid-monolayer gaseous holes appear in liquid monolayer. Molecular interactions controlling the phase separation include short-range van der Waals attraction and long range dipolar repulsion. At small distances where attraction dominates gaseous domains return to energy-minimizing circular shapes. But with size of the holes increasing beyond a critical value, dipolar repulsion becomes strong enough to deform the domains; forming even labyrinth patterns. We use Brewster angle microscopy to study the film. Our objective is to obtain a critical diameter of the domains beyond which they are non-circular. Experimental value will be compared with that from theory.

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