Abstract Submitted
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Topology and Geometry of 1D Translational Order on Curved Surface[1] XIANGJUN XING, Syracuse University — It is shown that one dimensional translational order on two dimensional curved substrate is naturally described by differential forms. A new type of global dislocation defects is identified and its relation with the topological properties of the embedding (compact) manifold is explored using algebraic topological methods. The associated topological charge classifies all ground states with no local defects. The energetics of smectic order on curved substrate is also discussed. Coupling between nematic director field and extrinsic curvature is shown to be important. As a simple application, the phase diagram of smectic order on a torus is analyzed. Two phases are identified: a small/thin phase where the nematic director is locked by curvature and a large/fat phase where the director varies continuously with system parameters.

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