Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Tetratic order on elastic membranes: defects and geometry[1] OKSANA MANYUHINA, MARK BOWICK, Syracuse University — One of the fascinating problems in soft condensed matter is finding equilibrium shapes of elastic membranes subjected to additional constraints. It is known that confining nematic liquid crystal (with point symmetry group $D_{\infty h}$) on a surface of a sphere results in topological defects, which influence the overall shape of the closed surface and favour the formation of faceted tetrahedron (topologically equivalent to sphere). Nevertheless, because of the interplay between the local nematic orientational order and the global geometry of the closed membrane, identifying the ground state is not straightforward and requires numerical computation. We propose a phenomenological model to describe the tetratic order formed by particles with point symmetry group D_{4h} on surfaces with various Gaussian curvature. Self-organization of defect patterns as well as buckling instability of membranes are discussed and further connections with other soft matter systems are established.

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Date submitted: 15 Nov 2013 Electronic form version 1.4