

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Orientation of topological defects in 2D nematic liquid crystals<sup>1</sup>**

XINGZHOU TANG, JONATHAN SELINGER, Kent State Univ - Kent — Topological defects are an essential part of the structure and dynamics of all liquid crystals, and they are particularly important in experiments and simulations on active liquid crystals. In a recent paper [1], Vromans and Giomi pointed out that topological defects are not point-like objects but actually have orientational properties, which strongly affect the motion and energetics of the defects. That paper developed a mathematical formalism which describes the orientational properties as vectors. Here, we agree with the basic concept of defect orientation, but we disagree with the mathematical formalism of vectors, because it depends on an arbitrary choice of coordinate system. Instead, we represent the defect orientation by a tensor, with a rank that depends on the topological charge: rank 1 for a charge of  $+1/2$ , rank 3 for a charge of  $-1/2$ . Using this tensor formalism, we calculate the orientation-dependent interaction between defects, and we present numerical simulations of defect motion. [1] A. J. Vromans and L. Giomi, *Soft Matter* 12, 6490 (2016).

<sup>1</sup>Supported by NSF Grant No. DMR-1409658.

Jonathan Selinger  
Kent State Univ - Kent

Date submitted: 10 Nov 2016

Electronic form version 1.4