1046-65-1662 **X. Yang*** (xfyang@email.unc.edu), CB#3250, Phillips Hall, Chapel hill, NC 27599, **Gregory M Forest** (forest@amath.unc.edu), CB3250 Phillips hall, Chapel hill, NC 27599, **William M. Mullins** (mullins@email.unc.edu), CB#3250 Phillips Hall, Chapel hill, NC 27599, and **Qi Wang** (qwang@math.sc.edu), Univ of South Caroina, Columbia, SC 29208. *Dynamic defect morphology of sheared nematic polymers.*

The standard approach of defect characterization in liquid crystals and nematic polymers begins with the detection of topology from texture snapshots. Then one probes into the defect core to resolve the apparent discontinuity of the principal axis of orientation. However, it is time consuming and prohibitive to track the topological changes when the defects are created or annihilated. Instead, we focus on the detection of disordered phase in the core which are defined by local algebraic conditions on the eigenvalues of the second-moment tensor. The local disordered phases do not only exist for higher space dimensions, 2-d or 3-d, but also 0-d and 1-d. To illustrate these detection and tracking tools which are implemented automatically by the level set methods, we present the flow-orientation simulations in 2-d, where the topological defects and order degeneracy defects co-exist. In summary, local algebraic metrics clearly trump topology with respect to cost, detection, tracking of defects. (Received September 16, 2008)