

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Connecting the Chern number to polarization singularities**

THOMAS FÖSEL, Max Planck Institute for the Science of Light, Erlangen, VITTORIO PEANO, University of Malta, FLORIAN MARQUARDT, Friedrich-Alexander University, Erlangen; Max Planck Institute for the Science of Light, Erlangen — Topology has appeared in different physical contexts. The most prominent application is topologically protected edge transport in condensed matter physics. The Chern number, the topological invariant of gapped Bloch Hamiltonians, is an important quantity in this field. Another example of topology, in polarization physics, are polarization singularities, called L lines and C points. By establishing a connection between these two theories, we develop a novel technique to visualize and potentially measure the Chern number: it can be expressed either as the winding of the polarization azimuth along L lines in reciprocal space, or in terms of the handedness and the index of the associated C points. For mechanical systems, it is directly connected to the visible motion patterns.

Florian Marquardt  
Friedrich-Alexander University; Max Planck Institute

Date submitted: 20 Nov 2016

Electronic form version 1.4