Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

**Spatially varying geometric phase in classically entangled vector beams of light**[1] ANDREW KING-SMITH, CODY LEARY, The College of Wooster — We present theoretical results describing a spatially varying geometric (Pancharatnam) phase present in vector modes of light, in which the polarization and transverse spatial mode degrees of freedom exhibit classical entanglement. We propose an experimental setup capable of characterizing this effect, in which a vector mode propagates through a Mach-Zehnder interferometer with a birefringent phase retarder present in one arm. Since the polarization state of a classically entangled light beam exhibits spatial variation across the transverse mode profile, the phase retarder gives rise to a spatially varying geometric phase in the beam propagating through it. When recombined with the reference beam from the other interferometer arm, the presence of the geometric phase is exhibited in the resulting interference pattern.

[1]We acknowledge funding from the Research Corporation for Science Advancement by means of a Cottrell College Science Award.

Cody Leary
The College of Wooster

Date submitted: 06 Nov 2015 Electronic form version 1.4