

Abstract Submitted  
for the MAS17 Meeting of  
The American Physical Society

**Vortex beams of far-infrared synchrotron radiation for spectroscopy of quantum materials at MET, NSLS-II BNL** TOMASZ CYRULIK, TARAS STANISLAVCHUK, ANDREI SIRENKO, TAO ZHOU, New Jersey Inst of Tech, G. L. CARR, Brookhaven National Lab — We present a design of an optics system for conversion between conventional circularly or linearly polarized coherent synchrotron radiation into a vortex beam with a non-zero orbital angular momentum (OAM). The modified optical setup will be operational in a broad-band spectral range from  $20\text{ cm}^{-1}$  up to  $4000\text{ cm}^{-1}$  using Si and ZnSe axicone retarders producing OAM with  $l = +/-1$ . Beams with higher order of the OAM  $l = +/-1, +/-2, +/-3, +/-4$  and  $+/-5$  will be achieved with a motorized phase-shifting spiral mirror. Quantum materials will be studied using vortex beams at the MET beamline of NSLS-II, Brookhaven National Lab at low temperatures and in strong magnetic fields. This work is supported by NJIT-SEED Grant.

Tomasz Cyrulik  
New Jersey Inst of Tech

Date submitted: 30 Sep 2017

Electronic form version 1.4