Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Magneto-optical spectroscopic studies of solid and solution-phase tetra-phenyl porphyrin[1] JACOB WAHLEN-STROTHMAN, ZHEN WEN PAN, CODY LAMARCHE, LANE MANNING, NAVEEN RAWAT, University of Vermont, TAKAHISA TOKUMOTO, STEPHEN MCGILL, National High Magnetic Field Lab, MADALINA FURIS, KELVIN CHU, University of Vermont — Tetraphenylporphyrin (TPP) is a heterocyclic model system for porphyrins found in heme proteins, cytochromes and photosynthetic cofactors. TPP can accommodate a metal ion in the center; D-shell ion porphyrin complexes with a crystalline solid phase are of interest for magnetic studies because of the possibility of macroscopic long-range magnetic order of the ion spins. We have investigated the 5K magnetic properties of poly-crystalline thin films of TPP complexed with Zn, Mn and Cu and deposited through a room temperature capillary pen technique that produces grain size in the 100 micron to 1mm range. Our novel setup measures the UV/VIS, linear dichroism and MCD simultaneously and incorporates a photoelastic modulator and a microscopy superconducting magnet for high-field (5T) measurements. In addition, we present 25T data on samples from the new split magnet at NHMFL. We present solution and crystalline data on metal-complexed TPP; data are analyzed in terms of A and B-type MCD using a perimeter model. We find good agreement with previous solution data, and novel crystalline phase spectra that are correlated to the long range ordering of the solid state.

[1]This work supported by NSF DMR-0821268, DUE-0942562 and EPS-0701410

Kelvin Chu
University of Vermont

Date submitted: 15 Nov 2011 Electronic form version 1.4