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Spatially and Temperature Resolved Photoluminescence (PL) Of Excitons in Highly Oriented Phthalocyanine Films NAVEEN RAWAT, ZHENWEN PAN, LANE MANNING, Physics Dept and the Material Science Program, UVM, Burlington, VT, ANTHONY WETHERBY, RORY WATERMAN, Chemistry Dept, UVM, Burlington, VT, RANDY HEADRICK, MADALINA FURIS, Physics Dept and the Material Science Program, UVM, Burlington, VT — Phthalocyanines and their derivatives are interesting alternative to polymer materials for the development of electronic devices such as organic thin field effect transistors, organic Light Emitting Diodes and photovoltaic cells. The present study focuses on spatially resolved, temperature-dependent PL of highly-oriented metal free and Zn -Octabutoxy phthalocyanine (OBPc) polycrystalline thin films. Samples were fabricated using an in-house solution processing method[1] that results in mm-sized grains which can be individually probed using a focused laser beam. The experiments indicate the lowest optically active excitonic state which dominates the PL spectrum at 5K is optically-forbidden at room temperature. Linear Dichroism microscopy experiments indicate a reorientation of molecular planes below T$\sim$200K which may favor a mixing of Frenkel and intermolecular excitons, changing the nature of excitonic ground state.

[1]R. L. Headrick et al, APL, 92, 063302 (2008)

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[X] Prefer Oral Session
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