Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Probing laser induced space charge fields with Engineered Defects[1] HOSANNA ODHNER, Bryn Mawr College, GREG STONE, Pennsylvania State University, VOLKMAR DIEROLF, Lehigh University — We report on the ability to measure the buildup of space charge fields in ferroelectric materials with engineered defects, such as optically active rare earth ions. Analysis of the erbium emission reveals several changes in the intensity, frequency, and width of several peaks that occur on different time scales. Also, these changes are sensitive to the intrinsic defect concentration and the addition of extrinsic defects. Comparatively the magnitude of the spectral shifts for the different erbium peaks in erbium peaks are similar to those seen for an applied external electric field across the z-axis of the crystal. Also, several new peaks appear in the erbium emission demonstrating the ability to probe simultaneous changes in defect complexes.

[1]Supported by NSF-DMR 1008075.

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Date submitted: 19 Nov 2012 Electronic form version 1.4