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Spectral Hole Burning on an Optical Magnetic Dipole Transition ZACHARY BUCKHOLTZ, NICHOLAS BREWER, ELI MUELLER, DENIZ YAVUZ, University of Wisconsin - Madison — Rare-earth doped crystals have gained quite a bit of interest over the last few decades due to their unusual properties. They have very long coherence times for a solid giving them interesting applications in quantum information and quantum memory. Their rich electronic structure contains optical frequency magnetic dipole transitions giving them applications in building metamaterials. Many of the applications of rare-earth doped crystals require precise control of which rare-earth transitions are being addressed. Due to the complex nature of solids, this task can be quite involved, but can be accomplished through a process called spectral hole burning (SHB). We present our results of SHB on an optical magnetic dipole transition in europium doped yttrium orthosilicate (YSO). We also present our progress towards observing EIT on the selected magnetic transition.

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