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Hot Spots from Generated Defects in HMX Crystals[1] CHRISTIAN SORENSEN, NICHOLAS CUMMOCK, CAITLIN O'GRADY, I. EMRE GUNDUZ, STEVEN SON, Purdue University — There are several hot spot initiation mechanisms that have been proposed. However, direct observation of shock or impact compression of these mechanisms at macroscopic scale in explosives is difficult. Phase contrast imaging (PCI) may be applied to these systems. Here, high-speed video was used to record optical spectrum and for x-ray Phase Contrast Imaging (PCI) of shockwave interaction with low defect HMX crystals and crystals with engineered defects. Additionally, multiple crystals were arranged and observed under shock loading with PCI and optical high-speed video. Sample preparation techniques for generating voids and other engineered defects will be discussed. These methods include drilled holes and laser machined samples. Insight into hot spot mechanisms was obtained.

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