

Abstract Submitted  
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**Femtosecond micromachining of internal voids in high explosive crystals for studies of hot spot initiation** SHAWN MCGRANE, Los Alamos National Laboratory, ANDREW GRIECO, KYLE RAMOS, DANIEL HOOKS, DAVID MOORE — Femtosecond micromachining was used to produce controlled patterns of internal voids in high explosive single crystals of PETN, RDX, and HMX. Optical microscopy established that the voids generated near the threshold energy were localized to sub-micrometer diameters. Confocal Raman microscopy established that the defects generated were voids, with no chemical products observable and with diminished crystal spectral intensity. Increasing the micromachining energy above threshold led to microcracking along preferred crystalline planes. Consolidation of hundreds to thousands of individual voids allowed creation of defined two- and three- dimensional structures.

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