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Dynamic behaviour of KDP for laser-induced damage applications DAVID HEBERT, CEA, LUDOVIC HALLO, CELIA, LUC VOISIN, THIERRY DESANLIS, ALAIN GALTIE, BEATRICE BICREL, CEDRIC MAUNIER, PATRICK MERCIER, GUILLAUME DUCHATEAU, CEA — High power lasers as NIF in the USA or LMJ in France are being developed in order to produce inertial fusion confinement. However, the efficiency of these apertures is limited by laser-induced damage which occurs in the potassium dihydrogen phosphate (KDP) crystals allowing the frequency conversion. We present here hydrodynamic simulations that investigate the major processes following absorption of the laser energy on precursor defects, leading to the creation of a shock wave whose pressure lies in the GPa range. An associated rarefaction wave forms a cavity at the place of the precursor defect. In order to perform quantitative predictions, a reliable equation of state is required, along with strength properties. A review of available experimental data is presented and used to discuss the validity of different models for KDP.

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