

## Laser initiation of PETN at low luminosity

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### Abstract

We propose a method for separate determination of the efficiency of photochemical and thermochemical mechanisms of laser initiation of energetic materials. The method is based on the difference of initiation inertia of actual photo- and thermo-chemical processes leading to the different efficiency dependence of these mechanisms on the duration of the initiating pulse with sharply differing capacities of initiation. The experimental verification of the method was performed for PETN initiating at luminosity of  $10^9$  W/cm<sup>2</sup> at  $\lambda = 1064$  nm and  $10^4$  W/cm<sup>2</sup> at  $\lambda = 1070$  nm. The results allow us to compare the effectiveness of photo and thermo-chemical mechanisms for the case of pure PETN (photochemical mechanism) and PETN, 0.1% black (thermochemical mechanism), the threshold for initiating the photochemical mechanism being  $\sim 4$  J/cm<sup>2</sup>, for thermochemical  $\sim 14$  J/cm<sup>2</sup>.