Laser marking of a diamond surface with femto-picosecond laser radiation

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Diamond is a material with a combination of unique mechanical, optical, thermal and electrical properties, due to which it is in demand in many fields of application [1]. In this work, we investigated the ablation efficiency by measuring the lateral dimensions of the volumes of multipulse craters obtained on the diamond surface, depending on the duration of an ultrashort laser pulse (0.3-10 ps) when focusing through an objective with a numerical aperture of NA=0.65. It also demonstrates accurate marking of a diamond using a megahertz femtosecond generator, where the size of an individual element is 3-4 micrometers when focused by a lens with a numerical aperture of 0.25. This work was supported by Russian Science Foundation (grant 21-79-30063)

[1] Ionin A A, Kudryashov S I, Mikhin K E, Seleznev L V and Sinitsyn D V 1983 *Laser physics* **20** 1778–1782