

# Stress in diamond bulk induced by laser stimulated graphitization

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Manufacturing charge detectors involves creating inside diamond's bulk conducting pillars. This process induces stress in surrounding graphite diamond that negatively effects to detector's efficiency. However, stress investigation is not priority for literature. Existing models are incomplete and either are not taken into account existing of tensile stress or give not quantification for it. Question of magnitude of stress dependence from laser pulse energy is not paid attention completely.

In this work, we analyzed the stresses appeared during laser-stimulated graphitization of natural diamond containing 2 color zones and polished along the plane (331). Graphite micromarks were recorded using ultrashort laser pulses (300 fs, 515 nm) with different energies in both zones. Using Raman spectroscopy, areas of compression and tension were reveal, and profiles of these stresses were constructed along the directions of compression and tension were obtained as well as and the dependence of the magnitude of these stresses on the laser pulse energy at key points of the profiles.

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