Abstract Submitted
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Photoluminescence Study of Nanodiamond Defects JOSEPH KIMBALL, T.W. ZERDA, Texas Christian University, Department of Physics and Astronomy, B. ROUT, University of North Texas, Department of Physics, ANASTASIIA NEMASHKALO, Texas Christian University, Department of Physics and Astronomy — The unique properties of photoluminescent nanodiamonds make them a preferred candidate for optical labels in biological and medical imaging. To fully implement and understand their optical and physical properties, this study used two different techniques to create in TEM confirmed nanocrystal size range of 5 to 125 nm, the nitrogen vacancy (N-V) defects responsible for the emission of a photostable spectrum from 500-800 nm. The basic theory behind the diamond crystal lattice and point defects responsible for the light emitting nitrogen vacancy (N-V) center are presented. Two different methods, irradiation and high pressure-high temperature (HPTHP), are used to create the sought after (N-V) center. Photoluminescence results correlated with FTIR spectroscopy allowed the determination of the PL intensity relation to various defects, crystal size and nitrogen concentration.

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