Contribution ID: **486** Type: **Poster Presentation**

Application of uniaxial stress with Laplace DLTS as a structure sensitive characterization technique.

Tuesday, 5 July 2016 16:10 (1h 50m)

Abstract content
   (Max 300 words)
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This paper aims to explain the method adopted by the author for integration of uniaxial stress into the highly sensitive Laplace DLTS technique. The purpose of this integration was to provide a technique that would allow for study of defect structures based on changes in their electrical properties as a result of an external perturbation of their respective positions within the crystal lattice. The system consists of an apparatus that is capable of exerting external uniaxial stress of more than 10⁹ Pa while a Laplace DLTS system records the slightest changes in the emission rate spectrum of a defect. The data obtained in this manner is then used to determine properties such as orientational degeneracy, symmetry and composition of the defect as well as its placement with relation to the primitive cell of the host semiconductor. The system can operate between 77 K to 500 K and therefore is suitable for studying a wide range of defects. Preliminary experiments on EL2 and El2 like defects in n-type GaAs were carried out to determine the proper operation of the system and were shown to comply with previously published results.

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Session Classification: Poster Session (1)

Track Classification: Track A - Division for Physics of Condensed Matter and Materials