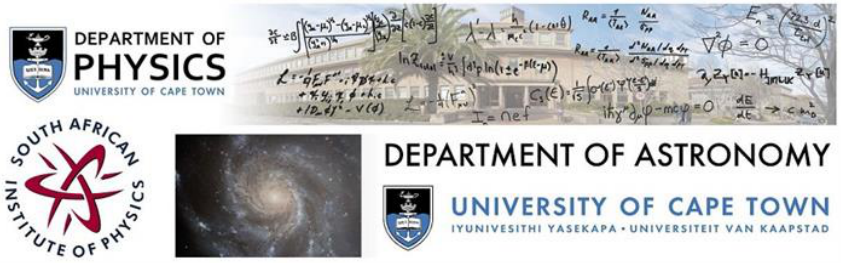

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Electrical characterisation of defects induced in GaN by electron beam exposure

Friday, 8 July 2016 14:40 (20 minutes)

Abstract content
   (Max 300 words)
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Gallium nitride (GaN) is a wide bandgap semiconductor with a bandgap value of 3.4 eV. This semiconductor has been utilised in optoelectronic applications which include the fabrication of both detecting and emitting devices. In studying the properties of semiconductors it is important to understand the role that defects play in the operation of the fabricated devices. These defects can be introduced by different processes including sample growth and various deposition techniques. Electron beam exposure (EBE) is a process by which a sample is exposed to electron beam deposition conditions without the evaporation of the metal onto the sample. In this study, GaN was subjected to this process. The target metal was tungsten as it has a high melting point. The quality of the Ni/Au Schottky contact deposited on the GaN substrate sample was assessed by measuring the current-voltage characteristics. Deep level transient spectroscopy (DLTS) was then used to characterise the electronically active defects in the sample. A defect, which has an activation energy of 0.12 eV and an apparent capture cross section of 8.00 × 10⁻¹⁸ cm², was induced by the EBE method.

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