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## The effect of temperature on electrical characteristics of Al/n-GaSb Schottky barrier diodes.

*Thursday, 28 June 2018 15:00 (2 hours)*

Schottky barrier diodes (SBDs) are a basic structure for semiconductor characterization. Aluminium (Al) SBDs were fabricated on Te-doped n-type Gallium Antimonide (GaSb) using electron beam deposition system. The electrical transport properties of Al/n-GaSb semiconductor material have been investigated. Current-voltage (I-V) and capacitance-voltage (C-V) characteristics of Al/n-GaSb Schottky diodes have been measured over a temperature range of 100-380 K in 20 K steps. The Schottky diode showed a temperature dependence of ideality factor ( $n$ ) from 1.07 to 1.28, with a room temperature value of 1.22. The barrier height ( $\phi_B$ ) was found to decrease from 0.65 eV at 380 K to 0.35 eV at 100 K. It was found that room temperature barrier heights were equal to 0.57 eV and 0.60 eV determined using I-V and C-V measurements, respectively. It was observed that the leakage current at -1.0 V increased in the range of  $3.82 \times 10^{-7}$  to  $5.41 \times 10^{-4}$  A. The results showed a typical diode behavior of Al/n-GaSb Schottky diode. The barrier height decreased while the ideality factor increased with a decrease in temperature.

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**Primary author:** Dr SITHOLE, Mpho (Sefako Makgatho Health Sciences University)

**Presenter:** Dr SITHOLE, Mpho (Sefako Makgatho Health Sciences University)

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