

III-Nitride Nanowire LEDs for Enhanced Light Technology

Abstract

In this talk, the prospects of III-nitride nanowire-based LEDs for enhanced luminescence are presented. It comprises of design, modelling and simulation of novel nanowire LED structures. The electron blocking layer and multiple quantum wells are introduced for enhanced light. A novel, white LED with improved thermal characteristics is designed and simulated for providing efficient light which may be used in underground mining. The LED is designed with $\text{HfO}_2/\text{SiO}_2$ doped silicon layer as encapsulation material which results 30.1% enhanced efficiency with minimization of electrons overflow. The encapsulate material based on nano $\text{HfO}_2/\text{SiO}_2$ not only enhances light extraction but also opens a broad new range of encapsulant engineering capabilities.