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Defects in Mg doped (Al,In)GaN thin films and nanostructures

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Development of p-type (Al,In)GaN revolutionized the field of solid state lighting in the way that it was hard to imagine, development and introduction to market of light emitters in short period of time and tremendous amount of progress in other areas that was enabled by such development. Although many studies have been done to understand the defects related to Mg incorporation in epitaxially grown AlInGaN films, there are still many open questions. These include the relationship between the defects (type and density) and Mg incorporated and the electrical property of the film. An interesting open question is how optical characteristics of Mg doped (Al, In) GaN can predict its electrical property. In this presentation, we try to address this question. Recent advances in development of nanostructures based on III-nitrides include growth of high quality GaN nanowires. Although large body of work exists in growth and characterization of Si doped GaN nanowires the report work on Mg doped GaN is scarce. In the present work, we will discuss our recent progress in studying optical and electrical characteristics of Mg doped GaN nanowires and defect stabilization in nanostructure and thin films.

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