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Growth and Characterization of GdGaO3 Multilayer Structures[1]

KUNAL BHATNAGAR, TONI SAUNCY, Angelo State University, RAVI DROOPAD, Texas State University — Molecular Beam Epitaxy (MBE) is an advanced atomic precision epitaxial deposition technique that utilizes Ultra High Vacuum conditions for optimal crystal growth. Recently, new MBE facilities have been installed at Texas State University. The facility includes growth chambers for III-V compound semiconductor, Si, II-VI semiconductors and analysis chambers for STM, XPS, LEED and other characterization techniques. Several novel structures have been produced and analyzed using characterization facilities at Angelo State University, namely Spectroscopic Ellipsometry(SE). SE is a non-destructive thin film characterization technique used for determining film thickness, interfacial roughness and optical properties of multilayered structures. Gadolinium Gallium Oxide(GdGaO3) is one material that is important as a high-k dielectric in compound semiconductor MOSFET application and has not been characterized very well using ellipsometry. Ellipsometric data will be presented for GaGdO3 on GaAs and optical properties will be discussed.

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Toni Sauncy
Angelo State University

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