

Abstract Submitted
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RHEED-TRAXS as a tool for in-situ stoichiometry control.¹

SANDEEP CHANDRIL, CAMERON KEENAN, THOMAS MYERS, DAVID LEDERMAN, West Virginia University — RHEED-total reflection x-ray spectroscopy (-TRAXS) is an in-situ chemical and structural characterization technique which is highly surface sensitive. This consists of a grazing-angle electron beam from which characteristic x-rays from the sample are measured also at grazing angles. We have demonstrated that monolayer sensitivity in Y and Mn films on GaN can be achieved. We have also developed a theoretical model for the angular dependence of the x-ray $K\alpha$ peaks for the thin films, based on Parratt's formalism for x-ray reflectivity and the electron trajectory simulation software CASINO, to correct for grazing angle electron beam as a source for x-rays. As the angular dependence is highly dependent upon the film thickness and the smoothness of the film, it can be used to determine the deposition rate of individual elements as well as the interface chemical roughness

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