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Resonant shake-up satellites in photoemission at the Ga 3p photothreshold in GaN[1] L. PLUCINSKI, T. LEARMONTH, L. COLAKEROL, S. BERNARDIS, Y. ZHANG, P.-A. GLANS, K.E. SMITH, Physics Dept., Boston University, A.A. ZAKHAROV, R. NYHOLM, MAX-Lab, Lund University, I. GRZEGORY, T. SUSKI, S. POROWSKI, Polish Acad. of Sciences, I. FRIEL, T. MOUSTAKAS, ECE Dept., Boston University — Photoemission spectra recorded near the Ga $3p$ photothreshold from both thin film and single crystal GaN have been found to contain shake-up satellites of the main Ga $3d$ emission line. The intensity of these satellites resonates at this threshold, and the satellites are associated with a $3d^8$ state. The correlation energies and binding energies for the satellite multiplet have been measured for the satellite and related Auger transitions. The satellite multiplet contains additional constant binding energy features not observed in previous studies of other Ga compounds. The present results are compared to published data for GaP and GaAs, as well as to our preliminary results for thin film $In_xGa_{1-x}N$ and $Al_xGa_{1-x}N$. Our results will be discussed in the context of the degree of correlation and magnitude of the respective band gaps in these materials.

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