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Element specific magnetic moments of Ni and Mn in multiferroic Bi_2NiMnO_6 film grown on $SrTiO_3$ substrate VEMURU KRISHNAMURTHY, Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA, DAVE KEAVNEY, Advanced Photon Source, Argonne National Laboratory, Argonne, Illinois 60439, USA, DAVID SINGH, Materials Science and Tech. Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee, 37831, USA , A. VENIMADHAV, Department of Cryogenic Engineering, Indian Institute of Technology, Kharagpur 721302, India, Q. LI, Department of Physics, Penn State University, University Park, Pennsylvania 16802, USA — X-ray magnetic circular dichroism (XMCD) and x-ray absorption spectroscopy (XAS) at Ni $L_{2,3}$ edges and at Mn $L_{2,3}$ edges have been performed at 4.5 K and higher temperatures in a multiferroic thin film grown on $SrTiO_3$(001) substrate. These spectra show that Ni is in a divalent state and Mn is in a tetravalent state. The total magnetic moment of Mn is found to be about 2.8 μ_B. The total magnetic moment at the Ni site is strongly reduced from the 2.0 μ_B expected for divalent Ni. We have also detected a small orbital magnetic moment at both Mn and Ni sites. We suggest that the weaker crystal fields at the Ni and Mn sites in the thin film give rise to an orbital moment. These results will be compared with the predictions of local spin density calculations. Supported by US Dept. of Energy.

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