

Abstract Submitted
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Temperature studies of multiferroic TbMnO₃ with resonant Raman scattering ILKA MAHNS, M. BASTJAN, B. SCHULZ, S. MUELLER, A. RUSYDI, M. RUEBHAUSEN, IAP, University of Hamburg, Germany, N. ALIOUANE, D.N. ARGYRIOU, HMI, Berlin, Germany, H. BARATH, M. KIM, S.L. COOPER, Dept. of Physics and Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, Illinois — Using temperature dependent resonant Raman scattering with different excitation energies from the ultraviolet (UV) to near infrared (NIR), we have investigated the complex interplay between the orbital, structural and magnetic ordering in the multiferroic material TbMnO₃. Depending on the scattering geometry, the magnetic transition at the Néel temperature at 41 K or the ferroelectric transition at $T_f = 28$ K is observed. In resonance studies with an incident frequency of 1.91 eV, the Jahn-Teller mode shows a strong softening below T_N . In the low frequency spectra, a quasielastic response is identified. The results give information about the electron-phonon coupling and the correlations between electronic and structural degrees of freedom that contribute to the multiferroic behavior in TbMnO₃.

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