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Observation of a new incommensurate phase in the spinel MnV2O4[1] GILBERTO DE LA PENA MUNOZ, SANGJUN LEE, SAMUEL GLEASON, TAYLOR BYRUM, XINYUE FANG, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign, SHIH-CHANG WENG, National Sychrotron Radiation Research Center, PETER ABBAMONTE, Frederick Seitz Materials Research Laboratory, University of Illinois at Urbana-Champaign — Using x-ray scattering, we studied the temperature dependence of a large volume of reciprocal space in a MnV2O4 spinel crystal. In addition to the known cubic to tetragonal phase transition at around 56 K, we observed previously unreported incommensurate modulation peaks at delta q = 0.33 0.33 -0.16. We measured the temperature dependence of these modulations and, while they exhibit a shift or splitting in momentum space analogous to that of the structural phase transition, they do so at higher temperature than the Bragg reflections (100K). Our results suggest that MnV2O4 has an additional phase transition that may a precursor for the V t2g orbital ordering, which is closely related to the cubic to tetragonal transition.

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