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Electronic Raman scattering in Magnetite[1] LEV GASPAROV, University of North Florida, G. GUNTHERODT, II. Physikalisches Institut, RWTH-Aachen, Germany, K.-Y. CHOI, NHMFL - Tallahassee, Fl, USA, H. BERGER, L. FORRO, EPFL-Lausanne, Switzerland — Raman spectra of optimally doped magnetite (Fe_3O_4) single crystals reveal broad electronic background extending up to 900 wavenumbers (∼110 meV). Redistribution of this background is observed when sample is cooled below the Verwey transition temperature (T_V= 123K). In particular, spectra of the low temperature phase show diminished background below 300 wavenumbers followed by an enhancement of the electronic background between 300 and 400 wavenumbers with subsequent decrease of the background below 400 wavenumbers. Such redistribution may be assigned to an opening of the charge gap at about 350 wavenumbers (43 meV). The value of the gap is within the range of the photoemission data on freshly fractured magnetite sample.

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