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Nonextensivity in Magnetic Systems IVAN OLIVEIRA, DIOGO PINTO SOARES, ROBERTO SARTHOUR, Brazilian Center for Research in Physics, MARIO REIS, Ciceco - Aveiro University — Nonextensive statistics has been successfully applied to different areas of physics, whenever long-range correlations, fractality, inhomogeneity or long time memory are present. Nonextensive thermodynamics is derived from the definition of nonextensive entropy: $S_q = k(1 - \sum_i p_i^q)/(q - 1)$, where p_i are probabilities and q is the so-called entropic index. From this definition one obtains the q -density matrix, ρ^q and, from it, thermodynamically related quantities. In condensed matter, strong correlated systems are good candidates to be approached from the nonextensive formalism. This is the case of manganese oxides, or manganites. They are magnetically inhomogeneous and present fractal grain structure. In the present work we discuss various features which are observed in manganites and, from experimental data, we give a physical interpretation for the entropic index q and calculate various aspects of the magnetism of different samples, such as the magnetic susceptibility and phase diagram. We also discuss magnetic elementary excitations in inhomogeneous media using the nonextensive approach.

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