Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Phase Diagram of the mixed spin-2 and spin-5/2 Ising system with two different single-ion anisotropies[1] JOSÉ CRUZ FILHO, MAURICIO GODOY, ALBERTO ARRUDA, Instituto de Física, Universidade Federal de Mato Grosso, 78060-900, Cuiabá, MT, Brazil — In the last five decades the Ising model has been one of the most largely used to describe critical behavior of several systems in the nature. In particular, in the physics of the condensed matter it is important to describe critical behavior and other thermodynamics properties of a variety of physic systems (disordered system, spins glass, random field Ising model, etc.). Recently, several extensions have been made in the spin$-1/2$ Ising model to describe a wide variety of physic systems. For example, the models consisting of mixed spins of different magnitudes are interesting extensions, which are so-called mixed-spin Ising models. In this work we present a study of the effects of two single-ion anisotropies in the phase diagram and in the compensation temperatures of the mixed spin-2 and spin-5/2 Ising ferrimagnetic system. We employ the mean-field theory based on the Bogoliubov inequality for the Gibbs free energy, and the Landau expansion of the free energy in the order parameter to describe the phase diagrams. In the plane critical temperature versus single-ion anisotropie the phase diagram display behavior tricritical (second-order transition separated of the first-order transition lines by a tricritical point).

[1]Financial support from the Brazilian Agencies FAPEMAT, CAPES, and CNPq is gratefully acknowledged

Alberto Arruda
Instituto de Física, Universidade Federal de Mato Grosso,
78060-900, Cuiabá, MT, Brazil

Date submitted: 07 Dec 2011 Electronic form version 1.4