

## Magnetic Properties of a Mixed Spin-2 and Spin-5/2 Heisenberg Ferrimagnetic System on a Two-Dimensional Honeycomb Lattice: Green's Function Approach

YAO Kai-Lun,<sup>1,2</sup> LI Jian-Wen,<sup>1</sup> LIU Zu-Li,<sup>1</sup> FU Hua-Hua,<sup>1</sup> and ZU Lin<sup>1</sup>

<sup>1</sup> Department of Physics, Huazhong University of Science and Technology, Wuhan 430074, China

<sup>2</sup> International Center of Material Physics, the Chinese Academy of Sciences, Shenyang 110015, China

(Received: 2006-4-30; Revised: )

**Abstract:** The multisublattice Green's function technique is applied to study the magnetic properties of a mixed spin-2 and spin-5/2 Heisenberg ferrimagnetic system on a two-dimensional honeycomb lattice. The role of the different interactions in the Hamiltonian is explored. When only the nearest-neighbor interaction and the single-ion anisotropy are included, our results indicate that there are compensation points at finite temperatures. When the next-nearest-neighbor interaction exceeds a minimum value that depends on the other parameters in the Hamiltonian, the compensation point disappears. The next-nearest-neighbor interaction has the effect of changing the compensation temperature.

PACS: 75.10.Jm, 75.40.Gb, 75.50.Gg

**Key words:** Heisenberg ferrimagnetic, Green function, spin-wave spectra, magnetization, critical temperature, compensation temperature

[\[Full text: PDF\]](#)

Close