

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

The spin -1 anisotropic Heisenberg antiferromagnet on a square lattice at low temperatures¹ ANTONIO PIRES, UFMG — In the last years the quantum two dimensional spin 1/2 Heisenberg antiferromagnet has been extensively studied. However, new physical features, such as quantum phase transitions, due to additional terms, as for instance single ion anisotropy, are possible when $S = 1$. Here we study the low temperature behavior of the quantum spin-1 Heisenberg antiferromagnet with exchange and single site anisotropies on the square lattice. The properties of the model change drastically as the single ions anisotropy D varies from very small to very large values. A quantum phase transition takes place at a critical value of D . Two techniques are used to study the model. In the low D region we use a self consistent harmonic approximation. For D above the critical value a bond operator formalism is used. We present the phase diagram for the model.

¹This work was partially supported by CNPQ and FAPEMIG.

Antonio Pires
UFMG

Date submitted: 28 Sep 2010

Electronic form version 1.4