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Magnetic properties of a two-dimensional spin 1 easy axis Heisenberg antiferromagnet with competing interaction[1] ANTONIO PIRES, GRIFFITH SOUSA, Universidade Federal de Minas Gerais — The square lattice antiferromagnet with next and next nearest neighbor exchange interaction has been the subject of intense research in the last years. It can present the behavior of a frustrated system and can otherwise describe real materials. However, a large part of the work has been dedicated to spin 1/2 and done at zero temperature. A system with spin 1 is of interest because it can have a single ion anisotropy. To study these models simple approaches which yield an analytical description are very useful for practical purposes. Here we use a Modified Spin Wave theory, where corrections owing to spin wave interactions are taken into account self-consistently, to study the easy axis two dimensional spin 1 antiferromagnet with competing interaction and single ion anisotropy. We calculate the phase diagram at zero temperature, and several thermodynamic quantities such as the magnetization, the gap and the specific heat. Their relations with the temperature and anisotropy parameter are analyzed over the entire range of temperature. We have found a Neel and a collinear phase separated by a disordered phase. This disordered phase could be a candidate for a spin liquid.

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