Abstract

A magnetic skyrmion is the smallest possible perturbation to a uniform magnet: a pointlike region of reversed magnetization, surrounded by a whirling twist of spins. Skyrmions only form in magnets in which spin interactions favor a magnetic structure with chiral symmetry, such as a twist that is either left- or right-handed. Two decades ago, theorists predicted such twists could occur when spins felt a competition between aligning with their neighbors and being perpendicular to them. In this picture, the strongest interaction between spins is Heisenberg exchange. The energy of this interaction, which favors the collinear alignment of neighboring spins and drives the ordering of many magnets, is given by the Heisenberg exchange integral J. But in the presence of DM interaction D, (symmetry breaking term in the energy equation), skyrmions were formed.In this thesis, we have investigated the consequence of a competition between the anisotropic DM, exchange J interaction and Magnetic Field H. Magnetic configurations are classified into different phases depending on the structure factor and real space plots. In this study we investigate some of the properties and phases of non-trivial spin structures which have multiple q states. These phases are characterised on the basis of structure factor and energy by the use of Monte Carlo simulations.