

THEORETISCH PHYSIKALISCHES KOLLOQUIUM

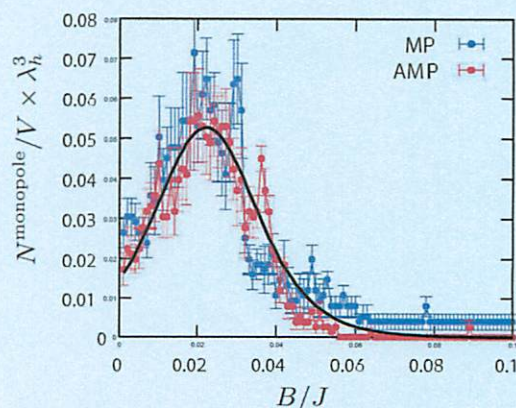
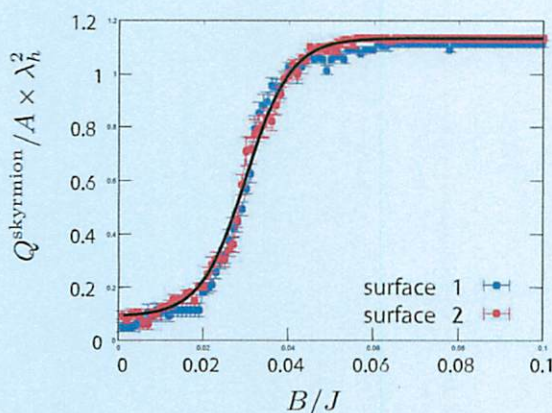
Donnerstag, den 20.07.2017 um 15:30 Uhr in Raum 46-576

Logistic Growth of Skyrmions in 3D Chiral Magnets

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Due to its potential application in spintronics and quantum information, skyrmion has been attracting numerous efforts in recent years. As one of the most important issues in this field, the process of topological phase transition in a chiral magnetic material from skyrmion lattice phase to helical phase has been investigated numerically and experimentally, yet the analytical expression of the evolution of skyrmion number and emergent magnetic monopole charge during the process is still waiting to be explored. In this talk, by utilizing the topological current theory, we show that the change of skyrmion number of a layer in the system is equal to the net monopole charges that flows through the layer. Based on this relation, with the help of statistical argument, we derive the analytical expressions of the skyrmion number and the monopole charge as functions of the external magnetic field. We find that the evolution of the skyrmion number is exactly the logistic growth function, and the evolution of the monopole charge is proportional to the derivative of the skyrmion number of the system. our analytical results are in good agreement with the numerical simulations in. The goodness of data fitting goes up to 99.94%.



Gäste sind herzlich willkommen.

Die Dozenten der Theoretischen Physik