CONFERENCIA

Spin dynamics of single and entangled rings studied by neutron spectroscopy

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Sala de Grados

Facultad de Ciencias - Unizar

13:00 horas

Molecular nanomagnets are model systems to study the spin dynamics and magnetic correlations in low dimensional magnets. Molecular wheels are a subclass of molecular magnets constituted by a finite number of magnetic ions at the vertices of regular polygons and interacting antiferromagnetically (AF). The advances in the chemical engineering of these molecules have allowed the synthesis of tailor-made systems displaying several interesting phenomena ranging from finite size effects on the magnetic properties of linear AF chains to the entanglement between complex spin systems. Neutron scattering techniques have been intensively and successfully used to study the microscopic properties of molecular magnets and have enabled to reveal the signatures of their quantum behaviour.

During the conference, Tatiana Guidi will show how inelastic neutron scattering experiments on single crystals of molecular rings can be used to directly determine the Fourier components of the two-spin dynamical correlations [1] and to portray entanglement in weakly coupled molecular qubits [2]. Furthermore, polarized neutron diffraction experiments have been used to determine the local magnetization in finite antiferromagnetic chains and to reveal the finite size effects in their spin density distribution [3].

[1] M. Baker, T. Guidi, et al, Nature Physics 8, 906 (2012).
[2] E Garlatti, T Guidi, et al, Nature Commun 8, 14543 (2017).
[3] T. Guidi, et al, Nature Commun 6, 7061 (2015).

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