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Slow dynamics in magnetic pyrochlore oxide systems

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Geometrically frustrated magnetic systems provide a large variety of unusual magnetic ground states. Among these, the pyrochlore oxide compounds (formula A2B2O7, where A is a magnetic rare-earth, and B a transition metal) have focused much attention, because their lattice, made of corner-sharing tetrahedra, is a source of strong magnetic frustration. It results in the stabilization of exotic magnetic ground states, such as classical or quantum spin-ices, spin-liquids or unconventional magnetic orders combined with spin fluctuations.
I will present a review of magnetization and ac susceptibility studies on these compounds which evidence the existence of slow dynamics at very low temperature. These dynamics coexist with fast fluctuations and / or magnetic ordering. They can be the signature of emergent excitations, such as magnetic monopoles in classical spin-ices (A=Ho, Dy) but in other systems (A=Tb, Er, Nd···), their origin remains an open issue. They could be due to loop dynamics, domain-wall dynamics, as well as induced by the presence of structural defects.

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