

Tracking the photo-induced phase transition in breathing-crystals

Thursday, 28 May 2015 09:00 (30 minutes)

The concept of photo-induced phase transitions and of time-resolved experiments will be illustrated on the basis of photoswitchable copper-nitroxide molecular magnets.

Molecular compounds with photoswitchable magnetic properties have been intensively investigated over the last decades due to their prospective applications in nanoelectronics, sensing and magnetic data storage. As a more recent material that allows optical manipulation of its magnetization, copper-nitroxide-based compounds have emerged as a new class of spin-crossover systems.

Unlike in classical spin-crossover compounds, the change in magnetic properties is based on reversible magneto-structural rearrangements between weakly and strongly exchange-coupled states of spin triads nitroxide-copper(II)-nitroxide (WS/SS states).

The mechanism of photoswitching between the two states and the resulting cooperative phenomenon is far from understood and requires ultrafast, time-resolved measurement techniques. Initial results covering a time range from femto- to microseconds using pump-probe absorption spectroscopy will be presented.

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