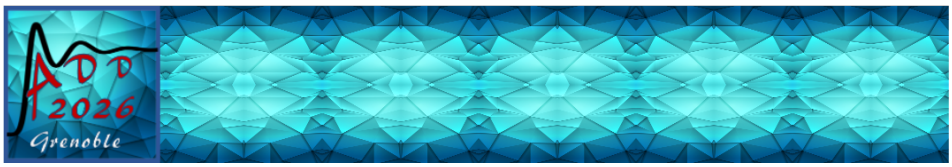

Abstract ID : **27**

Technical Aspects and Practices in Using Neutron Total Scattering for Local Magnetic Ordering Studies

Content

Spin-lattice coupling is a critical interaction in condensed matter physics that involves the interplay between the magnetic spins of electrons and the lattice structure of a material. This coupling can influence various physical properties, such as magnetization, thermal conductivity, and electronic structure. Understanding spin-lattice coupling is essential for developing advanced materials with tailored magnetic properties, promising advancements in spintronics, via precise control over magnetic and structural phases. Here in this presentation, I will be demonstrating the exploration of several magnetic system to reflect the spin-lattice coupling and its impact on magnetic properties, including kagome systems and a quantum spin liquid system. Conventionally, the focus for spin lattice coupling studies is more on the average structure, but here through the several cases we present, it is clear that the local structure plays a critical view in understanding the magnetic coupling in various systems. The main technique used here for the local structure studies is neutron total scattering and the main analysis technique is reverse Monte Carlo. Meanwhile, neutrons carry magnetic moments and will be scattered by magnetic moments in materials. Therefore, it can be used for detecting the magnetic ordering and naturally through the magnetic neutron total scattering signal, the local magnetic ordering can be potentially constructed. Here we are going to showcase this type of study with a spin-glass example.

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