Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **646** Type: **Oral (Non-Student) / Orale (non-étudiant(e))**

Magnon confinement

Wednesday 9 June 2021 17:15 (15 minutes)

Magnetic structures are known to possess magnetic excitations confined to their surfaces and interfaces, but these spatially localized modes are often not resolved in spectroscopy experiments. We developed a theory to calculate the confined magnon spectra and its associated spin scattering function, which is the physical observable in spectroscopy based on neutron and electron scattering, and a proxy for Raman and infrared optical experiments. We apply our theory to simple ferromagnetic and antiferromagnetic models to show that confined magnons are qualitatively different in these two systems. The theory shows that extra magnetic anisotropy at the system's edge quantitatively impacts magnon confinement in all cases. Our results provide insights on how to interpret magnetic spectroscopy experiments in nanostructures, and how their confined spectra is affected by surrounding materials.

Author: Mr BEAIRSTO, Seamus (Centre for Advanced Materials and Related Technology, University of Victoria)

Co-authors: Prof. CAZAYOUS, Maximilien (Laboratoire Matériaux et Phénomènes Quantiques, UMR 7162 CNRS, Université Paris Diderot); Dr FISHMAN, Randy S. (Materials Science and Technology Division, Oak Ridge National Laboratory); Prof. DE SOUSA, Rogério (Centre for Advanced Materials and Related Technology, University of Victoria)

Presenter: Prof. DE SOUSA, Rogério (Centre for Advanced Materials and Related Technology, University of Victoria)

Session Classification: W4-9 Magnetic North VII - Session 8 / Nord magnétique VII - session 8

Track Classification: Magnetic North/Magnétisme Nord