



Contribution ID: 12

Type: **Talk (20 min + 5 min discussion)**

## Magnetic excitations in long-range stripes of $\text{Pr}_2\text{NiO}_{4+\delta}$

Thursday, 8 December 2022 15:50 (25 minutes)

Magnetic excitations in stripe-phases of *La*-based hole-doped 214- nickelates, especially in the *Sr*-doped ones, have been vigorously explored using inelastic neutron scattering (INS) studies. In *Sr*-doped samples, the spin stripe correlation is relatively short-ranged due to unavoidable disorder introduced by the randomly distributed dopant. However, often the results have been compared with the linear spin wave (LSW) theory-based calculations, which assume long-range spin-stripe ordering.

In this talk, we will present the effect of long-range spin stripe ordering on the magnetic excitations of an *O*-doped 214- nickelate  $\text{Pr}_2\text{NiO}_{4+\delta}$  ( $\delta \sim 0.24$ ), where we find the spin stripe correlation is quite long-ranged ( $\sim 50 \text{ \AA}$ ) compared to the *Sr*-doped  $\text{Pr}_{2-x}\text{SrNiO}_4$  ( $\sim 20 \text{ \AA}$ ). For our investigation, we have performed the INS measurements using the thermal triple-axis spectrometer PUMA at MLZ, IN8 at ILL, and time-of-flight spectrometer MAPS at ISIS. Our investigation presents an intriguing observation of multiple equivalent weak modes in the spin wave dispersion of *O*-doped  $\text{Pr}_{2-x}\text{SrNiO}_4$  [1], which we have interpreted from the internal periodicity of the long-range ordered discommensurated spin stripes.

Reference: [1] A. Maity, R. Dutta, A. Marsicano, A Piovano, J. Ross Stewart and W. Paulus Phys. Rev. B 103, L100401 (2021).

**Primary author:** MAITY, Avishek (Heinz Maier-Leibnitz Zentrum (MLZ), Technische Universität München, 85747 Garching, Germany)

**Co-authors:** Dr DUTTA, Rajesh (Jülich Centre for Neutron Science (JCNS) at Heinz Maier-Leibnitz Zentrum (MLZ), 85747 Garching, Germany); MARSICANO, Anna (Institut Charles Gerhardt Montpellier, Université de Montpellier, CNRS-ENSCM, 34095 Montpellier, France); PIOVANO, Andrea (Institut Laue-Langevin, 71 Avenue des Martyrs, 38000 Grenoble, France); STEWART, J. Ross (ISIS Neutron and Muon Source, Rutherford Appleton Laboratory, Didcot OX11 0QX, United Kingdom); PAULUS, Werner (Institut Charles Gerhardt Montpellier, Université de Montpellier, CNRS-ENSCM, 34095 Montpellier, France)

**Presenter:** MAITY, Avishek (Heinz Maier-Leibnitz Zentrum (MLZ), Technische Universität München, 85747 Garching, Germany)

**Session Classification:** Quantum Phenomena

**Track Classification:** Quantum Phenomena