



Contribution ID: 11

Type: Poster

## Spin Dynamics, Critical Scattering and Magnetoelectric Coupling Mechanism of $\text{Mn}_4\text{Nb}_2\text{O}_9$

Thursday, 25 November 2021 17:49 (1 minute)

The spin dynamics of  $\text{Mn}_4\text{Nb}_2\text{O}_9$  were studied by using inelastic neutron scattering. A spin-dynamic model is proposed to explain the observed spin-wave excitation spectrum. The model indicates that the exchange interactions along the chain direction are weakly ferromagnetic while the exchange interactions between the neighbour chains are strongly antiferromagnetic. Such an antiferromagnetic configuration in the hexagonal plane causes spin frustration with a spin gap of about 1.4 meV at the zone centre. The  $\text{Mn}^{2+}$  ions in this material demonstrate a very weak easy-axis single-ion anisotropy. Critical scattering in the vicinity of  $T_N$  was studied. On the basis of the magnetic structure and spin-dynamic models, the weak magnetoelectric coupling effect in  $\text{Mn}_4\text{Nb}_2\text{O}_9$  is ascribed to the weak magnetostriction due to the subtle difference between  $\text{Mn}^{2+}$  ions on the  $\text{Mn}_I$  and  $\text{Mn}_{II}$  sites.

Presenter Gender

Man

Do you wish to take part in the Student Poster Slam

No

Condition of submission

Yes

Students Only - Are you interested in AINSE student funding

No

Level of Expertise

Experienced Researcher

Pronouns

He/Him

Which facility did you use for your research

Australian Centre for Neutron Scattering

Primary authors: Dr DENG, Guochu (1Australian Centre for Neutron Scattering, Australian Nuclear Science and Technology Organisation); Prof. CAO, Shixun (Department of Physics, Shanghai University); Prof. MCINTYRE, Garry J (Australian Centre for Neutron Scattering, Australian Nuclear Science and Technology Organisation)

Co-authors: ZHAO, Gang (Department of Physics, Shanghai University); ZHU, Shuang (Department of Physics, Shanghai University); Prof. FENG, Zhenjie (Department of Physics, Shanghai University); Prof. REN, Wei (Department of Physics, Shanghai University,); Dr STUDER, Andrew (Australian Centre for Neutron Scattering, Australian Nuclear Science and Technology Organisation)

Presenter: DENG, Guochu (Australian Nuclear Science and Technology Organization)

Session Classification: Poster Session

Track Classification: Instruments & Techniques