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CsNiCrF6: A Model System for Studying 1D Spin Dynamics with Muons

Friday, 25 July 2025 10:10 (20 minutes)

$CsNiCrF_6$ is a compound which exhibits multiple coulomb phases: charge ice, displacement ice and spin ice. Having all three of these Coulomb phases ensures that bulk techniques for measuring the dynamics in this compound struggle to grapple with the inherent disorder present [1], and density functional theory calculations on this compound are prohibitively expensive. In this talk, I will provide an in-depth muon study of this compound, showing how the muon site can be determined using the F—μ—F states without needing to resort to DFT calculations, and utilising this to show the 1 dimensional nature of the dynamics of the material using μSR in high longitudinal fields. I will also discuss how our results are strongly supportive of the 'loop model'for Heisenberg pyrochlore antiferromagnets, making this compound a model playground for such physics.

[1] T. Fennell et al., Nat. Phys. 15, 60 (2019).

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