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Inward shift in the spin wave dispersion of a stripe discommensurated Pr-based 214-nickelate

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Magnetic excitations in the spin-stripe phases of *La*-based 214-nickelates have been vigorously explored using INS for almost last three decades and still have remained an exciting research field, especially to understand their differences yet of their structural similarities with high- T_c 214-cuprates. In view of the reported two-dimensional antiferromagnetic nature, out-of-plane magnetic excitations are generally not expected in 214-nickelates. From the INS measurements of magnetic excitations in a stripe discommensurated $\text{Pr}_{3/2}\text{Sr}_{1/2}\text{NiO}_4$ with magnetic incommensurability $\epsilon = 0.4$, here we present very compelling evidence for a sizable out-of-plane interaction (~ 2.2 meV) which was crucial to explain the observed shift of the spin wave dispersions towards the magnetic zone centers.

Reference: A. Maity, R. Dutta, and W. Paulus, Phys. Rev. Lett. 124, 147202 (2020).

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