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【701】 Field-induced bound-state condensation and spin-nematic phase of $\text{SrCu}_2(\text{BO}_3)_2$ revealed by neutron scattering up to 25.9 T

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Chasing new states of quantum matter is a central element in condensed matter physics, motivated both by curiosity but also by the need for understanding of many-body quantum effects. One particularly interesting system is the frustrated Shastry-Sutherland model consisting of orthogonal spin pairs. The network of Cu^{2+} ions in $\text{SrCu}_2(\text{BO}_3)_2$ is topologically equivalent to this lattice and therefore presents a unique experimental testing opportunity. We study the magnetic excitations in $\text{SrCu}_2(\text{BO}_3)_2$ upon approaching the first magnetization plateau at 27 T using inelastic neutron scattering. At field values much below the transition an unexpected mode shows up. We set out to identify the nature of this new excitation.

Theoretical Work

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