



## Unconventional magnetic excitations and complementary neutron scattering sum rule on spin-1/2 triangular antiferromagnets

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Surprisingly, recent inelastic neutron scattering experiments on the spin-1/2 triangular lattice antiferromagnet (TLAF)  $\text{Ba}_3\text{CoSb}_2\text{O}_9$  reveal unconventional multiband higher energy excitations that might be relevant to quantum nonlinearity. To clarify whether this unconventional higher energy excitation continuum is universal for spin-1/2 triangular antiferromagnets or not, various high-resolution neutron spectroscopy measurements on polycrystalline  $\text{Ba}_3\text{CoNb}_2\text{O}_9$  and  $\text{Ba}_3\text{CoTa}_2\text{O}_9$  were performed and achieved an unprecedented energy and time scale.

In this poster, the magnetic excitations of the novel spin-1/2 TLAF  $\text{Ba}_3\text{CoNb}_2\text{O}_9$  and  $\text{Ba}_3\text{CoTa}_2\text{O}_9$  will be presented. The strong quantum fluctuations of the effective S-1/2 cobalt moments are evident by the higher energy continuum qualitatively observed in both compounds. A Heisenberg model will be discussed with spin wave theory. The physical interpretation of quantum fluctuation will be shown in detail.

Additionally, the updated work on a complementary neutron spectroscopy sum rule for frustrated magnets will be presented. This rule is an extension to the current version of total moment sum rule to the macroscopic measurable quantities. As an example, its application on  $\text{Ba}_3\text{CoNb}_2\text{O}_9$  and  $\text{Ba}_3\text{CoTa}_2\text{O}_9$  will be illustrated.

### I apply for the best Poster Poster Award

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**Sitzung Einordnung:** Mounting Posters, Beer and light Dinner

**Track Klassifizierung:** Magnetism & Superconductivity