Abstract Submitted
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**Excitations in a perfect magnetized quantum spin ladder**[1] ANDREY ZHELUDEV, DAVID SCHMIDIGER, SEBASTIAN MUEHLBAUER[2], GVASALIYA SEVERIAN, ETH Zurich, PIERRE BOUILLOT, CORINNA KOLLATH, THIERRY GIAMARCHI, U. Geneva, TATIANA GUIDI, ROBERT BEWLEY, ISIS, GEORG EHLERS, ORNL — The strong-leg $S = 1/2$ Heisenberg spin ladder system $C_7(D_{10}N)_2CuBr_4$ is investigated in applied magnetic fields using inelastic neutron scattering anf DMRG calculations. The spectrum in the high-field Tomonaga-Luttinger spin liquid phase is found to be qualitatively different from that in the low-field spin gap phase. In the former, numerous spectral featrures, including incommensurate excitations and multi-spinon continua are identified. In contrast, the latter is dominated by long-lived magnon excitations and two-magnon bound states [1]. An unprecedented quantitive agreement between experiment and numerical claculations is achieved.

[1] D. Schmidiger, P. Bouillot, S. Muhlbauer, S. Gvasaliya, C. Kollath, T. Giamarchi, A. Zheludev, Phys. Rev. Lett. **108**, 167201 (2012).

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