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Magnetic Excitations in the Spin-1 Anisotropic Heisenberg Antiferromagnetic Chain System $NiCl_2$-4SC$(NH_2)_2$[1] SERGEI ZVYAGIN, Dresden High Magnetic Field Laboratory (HLD-FZD) — Electron spin resonance studies of magnetic excitations in $NiCl_2$-4SC$(NH_2)_2$ (DTN, a quantum $S = 1$ chain system with strong easy-pane anisotropy and a new candidate for the Bose-Einstein condensation of the spin degrees of freedom) in fields up to 25 T are presented. Based on analysis of the frequency-field dependence of single-magnon mode in the high-field spin-polarized phase and previous experimental results [Phys. Rev. Lett. 96, 07724 (2006)], a revised set of spin- Hamiltonian parameters is obtained. Our results yield $D = 8.9$ K, $J_c = 2.2$ K, and $J_{a,b} = 0.18$ K for the anisotropy, intra- and inter-chain exchange interactions, respectively. These values are used to calculate the AFM-phase boundary, low- temperature magnetization and the frequency-field dependence of two-magnon bound-state excitations predicted by theory and observed in DTN for the first time. Excellent quantitative agreement with experimental data is obtained.

[1]In collaboration with C. D. Batista, M. Tsukamoto, N. Kawashima, J. Krzystek, V. S. Zapf, M. Jaime, J. Wosnitza, N. F. Oliveira, Jr., A. Paduan-Filho

Sergei Zvyagin
Dresden High Magnetic Field Laboratory (HLD-FZD)

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