Magnetic Properties of the quasi-2D S=1/2 Heisenberg antiferromagnet \([\text{Cu(pyz)}_2(\text{HF}_2)]\text{PF}_6\)

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single crystals, identified as a quasi-two-dimensional spin-1/2 Heisenberg antiferromagnet. Our measurements revealed

\[ J_{\text{inter}}/J_{\text{intra}} \leq 0.063 \quad \text{and} \quad A/J \sim 0.003 , \]

where \( J_{\text{inter}}, J_{\text{intra}}, J \) are the interplane, intraplane and mean exchange interactions, respectively, and \( A \) is the anisotropy constant. It is argued that the magnetic properties of this material (including high-magnetic-field magnetization and the temperature-field phase diagram) are strongly affected by two-dimensional spin fluctuations, despite of onset of 3D long-range magnetic ordering at \( T_N \approx 4.4 \) K.

The ESR magnetic excitation spectrum in the 3D ordered phase is studied in detail.