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Magnetic short and long range order in a disordered perovskite SHRAVANI CHILLAL, SEVERIAN GVASALIYA, ANDREY ZHELUDEV, Neutron Scattering and Magnetism, Laboratory for Solid State Physics, ETH Zürich, 8093 Zürich, Switzerland, FRED J. LITTERST, DENNIS SCHRÖDER, MATHIAS KRAKEN, Institut für Physik der Kondensierten Materie, Technische Universität Braunschweig, 38106 Braunschweig, Germany, SERGEY LUSHNIKOV, TATIANA SHAPLYGINA, Ioffe Physico-Technical Institute RAS, 194021 St. Petersburg, Russia — PbFe_{1/2}Ta_{1/2}O₃ (PFT) belongs to the family of PbB'_xB''_{1-x}O₃ perovskites with inherent chemical disorder at the B-site. We have studied the magnetic phase diagram of PFT through macroscopic techniques, neutron scattering and Mössbauer spectroscopy. We show that PFT undergoes two phase transitions: paramagnetic to antiferromagnetic transition at $T_N \sim 153$ K and a spinglass transition at $T_{SG} \sim 10$ K. Below T_{SG} , antiferromagnetism coexists with spinglass on microscopic scale. We suggest that the arrangement of magnetic moments in this unusual ground state of PFT is a speromagnet-like, similar to the one proposed for PbFe_{1/2}Nb_{1/2}O₃.¹

¹S. Chillal, M. Thede, F. J. Litterst, S. N. Gvasaliya, T. A. Shaplygina, S. G. Lushnikov, and A. Zheludev, Phys. Rev. B 87, 220403 (2013).

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