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Magnetism and Superconductivity in $Rb_{1-x}Fe_{2-y}Se_2$ VLADIMIR TSURKAN, Academy of Sciences of Moldova, JOACHIM DEISENHOFER, AXEL GUNTHER, JONAS FISCHER, ZHE WANG, MICHAEL SCHMIDT, HANS-ALBRECHT KRUG VON NIDDA, SE-BASTIAN WIDMANN, ALOIS LOIDL, Augsburg University — We report on the structural, magnetic, and superconducting properties The system exhibits a strongly of $Rb_{1-x}Fe_{2-y}Se_2$ single crystals. anisotropic antiferromagnetic behavior below 400 K. For 1.53 < 2 - y < 0.001.6 superconductivity is found, whereas for Fe concentrations 2-y < 11.5 and 2-y > 1.6 insulating and semiconducting behavior is observed, respectively. The sharpest transition to the superconducting state and the highest transition temperature T_c of 32.4 K is found for compositions close to Rb₂Fe₄Se₅. Comparison of the magnetic behavior of nonsuperconducting and superconducting samples provides evidence for the coexistence of superconductivity and static antiferromagnetic order [1]. THz time-domain transmission spectroscopy in superconducting samples evidences a metallic response and the superconducting transition of the system [2].

- [1] V. Tsurkan et al., Phys. Rev. B 84, 144520 (2011).
- [2] A. Charnukha et al., arXiv:1108.5698.

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