

Magnetism of PrFeAsO parent compound for iron-based superconductors studied by Mössbauer spectroscopy

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The PrFeAsO was studied by Mössbauer spectroscopy in temperature range 4.2 – 300 K. An itinerant 3d magnetic order develops at about 165 K and it is accompanied by an orthorhombic distortion of the chemical unit cell. A complete longitudinal 3d incommensurate spin density wave (SDW) order develops at about 140 K. A region between above two temperatures is called a “nematic” phase with poorly understood microscopic magnetic properties. Significant part of SDW along propagation direction is almost free of the ordered electronic spins in the “nematic” region. Hence, it is likely that somewhat “mysterious nematic” phase is a region of incoherent spin density wavelets typical for a critical region.