ON THE CRYSTAL AND MAGNETIC BEHAVIOUR OF ScFe$_4$Al$_8$
SINGLE CRYSTAL

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Nuclear and magnetic properties of the ScFe$_4$Al$_8$ single crystal attracts our attention owing to the unparalleled complexity of nuclear and magnetic structures. Our previous neutron measurements [1] revealed presence of two modulation vectors, both along [ξ0], however with different critical temperatures. Recent experiment forced us to revise our knowledge of the structural ordering in the sample. So far, the crystal structure of this alloy, being of ThMn$_{12}$-type, has never been questioned. Let us remind, that the ternary compounds with the general formula MFe$_4$Al$_8$ M=(Ac, Re, Sc) which have been ever reported as crystallizing in the body centered tetragonal I 4/mmm symmetry (no. 139) form a large family of the intermetallics with a variety of magnetic structures and in consequence physical properties. Our earlier studies carried out on crystal and magnetic structures of (U, Th)(FeAl)$_{12}$ samples showed identity of crystal structures and even certain magnetic similarity in both series of actinide’s systems. In case of scandium compound these rules turned out to fail.


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