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Magnetic ground state of alpha-NaFeO₂

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Many alkali transition-metal dioxides (AMO₂ with M =V, Cr, Fe, Co, and Ni) belong to the rhombohedral systems (space group R3m) crystallizing with the layered alpha-NaFeO₂ structure. These compounds have been heavily investigated since the 1970s, originally due to their complex magnetic nature caused by the layered structure. Recently, the presence of both incommensurate (IC) AF order at $4 < T < 11$ K and short-range order until at least 50 K was proposed for alpha-NaFeO₂ with TN=4 K by neutron measurements [1]. In order to study the magnetic ground state of alpha-NaFeO₂, in which Fe[3+] ions form a two-dimensional triangular lattice, we have measured muSR spectra in the T range between 1.8 and 50 K using a powder sample. ZF-measurements reveal the presence of quasi-static magnetic order below 9.5 K, although the oscillation amplitude is very weak in the T-range between 4 and 7 K. Furthermore, the ZF measurements indicate the absence of any short-range order above 20 K.

[1] T. McQueen et al., Phys. Rev. B 76, 024420 (2007).

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Multiple order parameter systems

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