Erratum: Magnetic quantum oscillations in doped antiferromagnetic insulators

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Our expression for the oscillating part of the magnetic moment \(\vec{M}(B)\), Eq. (7), based on the energy spectrum Eq. (6) originally derived by Ramazashvili,\(^{2}\) predicts the peculiar dependence of dHvA magneto-oscillation amplitudes, \(M_r\), on the azimuthal in-plane angle \(\Phi\) between the magnetic field \(B\) and the magnetization axis, \(M_r \propto \cos^2(\pi r m_x) \cos^{1/2} \tan(\Theta) \cos(\Phi) / m_x\) (\(\Theta\) is the polar angle between the out-of-plane direction and \(B\) in two-dimensional doped antiferromagnetic insulators).

Here we would like to point out that this expression as well as all following equations are restricted to moderate magnetic fields, \(B < B_{SF}\), where \(B_{SF}\) is the spin-flop field of the antiferromagnetic background. In sufficiently strong fields \(B > B_{SF}\) the magnetization axis rotates remaining perpendicular to \(B\), so that our original conclusion should be altered. All our equations can be still applied but with \(\Phi = \pi/2\) and \(B_s = 0\). Hence the \(g\) factor is near absent for any field orientation in this strong-field regime. In high temperature superconductors the spin-flop field is relatively small \(B_{SF} < 10\) Tesla.\(^{3}\) Therefore the absence of the \(g\) factor, recently observed in quantum oscillation experiments\(^{4}\) for \(B > 30\) Tesla, is in agreement with the earlier theoretical predictions.\(^{1,2,5}\)

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