

Abstract Submitted
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Theory for Magnetic Resonance Force Microscopy with Ions in a Crystalline Field THOMAS FAN, VLADIMIR TSIFRINOVICH, Polytechnic Institute of NYU — We have developed theory for the detection of a single spin $S > 1$ using magnetic resonance force microscopy (MRFM). The anisotropy caused by the crystalline field is taken into account. The MRFM signal (i.e. the frequency shift of the cantilever vibrations) in the oscillating cantilever-driven adiabatic reversals technique is computed using a semi-classical approach: the spin is treated quantum mechanically, and the cantilever vibrations classically. We have shown that, in the harmonic approximation, the MRFM signal for a spin $S > 1$ is the same as for spin $S = 1/2$. We have obtained the analytical estimate for the half-width of the MRFM signal.

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