

Abstract Submitted
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STM NMR: local spectroscopy of a nuclear spin ALEXANDER BALATSKY, Los Alamos National Laboratory — Not all noise in experimental measurements is unwelcome. Certain types of fundamental noise contain valuable information about the system itself – a notable example being the inherent voltage fluctuations that exist across the terminals of any resistor (Johnson noise), from which the electron temperature may be determined. In magnetic systems, fundamental noise can exist in the form of random spin fluctuations. Felix Bloch noted in 1946 that statistical fluctuations of N paramagnetic spins should give rise to measurable noise of order \sqrt{N} spins, even in zero magnetic field. I will present the model of the noise in the STM spin polarized tunneling current that couples to the nuclear spin. Noise will have a feature that reflect the dynamics of a nuclear spin. This noise spectroscopy opens up a possibility to develop a single nuclear spin NMR spectroscopy.

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