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Autore	Peter Moritz
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Sommario/riassunto	The present work introduces a new concept for magnetic resonance measurements in the GHz regime inside a scanning tunneling microscope. It is based on heterodyne detection in a spin-polarized tunneling barrier. The experimental requirements, including a new method to suppress transmission effects, are explained. Measurements on three model systems which were studied to validate the new technique are presented and compared to simulations.