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**Cross Polarization Imaging with Magnetic Resonance Force Microscopy** KAI W. EBERHARDT, QIONG LIN, ANDREAS HUNKELER, URBAN MEIER, BEAT H. MEIER, ETH Zurich — Cross Polarization (CP) is a standard method in Nuclear Magnetic Resonance Spectroscopy (NMR) for signal enhancement of nuclei with a low gyromagnetic ratio and was recently applied in MRFM [1]. We demonstrate two techniques based on CP. In the first we perform frequency-swept CP to enhance the polarization of low- $\gamma$  S-spins. In the second method the S spins are used as a polarization sink for the high- $\gamma$  I-spins coupled to them. The I-spins can be completely depolarized by adding phase-jumps to the frequency-sweep of the S-spin channel, allowing that their presence is detected indirectly via the high- $\gamma$ , often more abundant I-spins with improved SNR. 1D images with  $\mu\text{m}$ -resolution of a  $KPF_6 - CaF_2$  sample are presented for both techniques. In the example the depolarization scheme allowed for an order of magnitude signal-to-noise ratio enhancement over direct detection. [1] Q. Lin et al., Phys. Rev. Lett. 2006, 96, 137604.

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