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A Novel Sampling/Reconstruction Method for Non-Proton and Low Field MRI

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Due to the limitations of low field magnetic resonance imaging (MRI), lung imaging is often reserved for expensive high field scanners. If these limitations were reduced or eliminated, low field MRI could be a cost-effective avenue for lung imaging, giving more clinics access to the tools necessary to diagnose various pulmonary diseases.

Certain contrast agents, such as hyperpolarized ^{129}Xe , are able to significantly improve the signal quality of low field images; however, each dose incurs a hefty price tag. To take full advantage of these doses, we use a significant under-sampling and reconstruction scheme, in combination with a specific averaging pattern, to achieve higher image quality at low field strengths without increasing acquisition time and without requiring hardware modifications.

In-vitro tests have already demonstrated this technique's feasibility, and our group is preparing for possible in-vivo tests.