Contribution ID: **64** Type: **Oral**

MRI at 10 mT using SQUID detection in an open environment

Tuesday 28 October 2025 15:10 (20 minutes)

While low field MRI has seen recent breakthrough in several academic and commercial groups1,2, ranging between 50 and 200 mT, field cycling studies have revealed that the most interesting contrast can be obtained in the ultra-low field (ULF) regime (⊠ 10 mT)3. However, at such low fields, low signal-to-noise ratio (SNR) becomes a problem. The use of superconducting quantum interference devices (SQUID) for signal acquisition has been proposed to tackle this issue4. In this work, we present a 3D image of a human wrist and a garlic bulb, both captured using our custom system at 10 mT using a SQUID volume gradiometer and the EDITER method5 for post-processing noise cancellation, demonstrating its potential for producing high-quality images in low-field MRI applications6. The next step is a first in vivo breast image acquired by early 2026.

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