Performance of the ALMA Band 10 SIS Receiver Prototype Model

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Abstract - In this paper we report the first co-registered, interleaved measurements of ultra-low field (ULF) magnetic resonance imaging (MRI) and magnetoencephalography (MEG). Interleaved measurements are interesting for the ultimate aim of combining MEG and functional MRI at ULF. The measurement system consisted of 7 channels with second-order gradiometers coupled to low transition-temperature superconducting quantum interference devices (SQUIDs). The ULF MRI was acquired at a measurement field of 94 μT after a pre-polarization in a 30 mT field. Our results show that the two modalities can be performed with interleaved measurements. However, due to transients from the walls of the magnetically shielded room a waiting time of more than 3 s had to be introduced between the MRI protocol and the auditory stimulus for the MEG.

Index Terms - Magnetic resonance imaging, Coils, Magnetic noise, SQUIDs, Magnetic shielding, Protocols.

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