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Microwave SQUID multiplexing of large MMC detector arrays

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Metallic magnetic calorimeters (MMCs) are the devices of choice for many spectroscopic applications since they provide a very good energy resolution, a very fast intrinsic signal rise time as well as an excellent linearity. While single MMCs or small detector arrays are typically read out by dc-SQUIDs, the readout of very large arrays requires a cryogenic multiplexing technique to reduce the parasitic heat load to the cold stage of the cryostat, the system complexity as well as cost.
A very promising approach for the readout of very large MMC arrays is microwave SQUID multiplexing. Here, the initial detector signal is transduced into a resonance frequency shift of a related superconducting λ/4 microwave resonator by means of a non-hysteretic, unshunted rf-SQUID. By coupling many resonators - each with unique resonance frequency - to a common transmission line, this frequency domain multiplexing technique allows for the readout of hundreds or thousand pixels with only one HEMT amplifier and two coaxial cables.
In this contribution we discuss the performance of a recently developed 64 pixel MMC detector array that is read out by means of an on-chip multiplexer and demonstrate the simultaneous readout of two MMCs by means of a microwave SQUID multiplexe

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