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## **【609】 Propagating Spin-Wave Spectroscopy Studies in a Millikelvin Temperature Environment**

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Technological advancements in the access to millikelvin temperatures allow first steps towards the investigation of individual magnons in the field of quantum magnonics [1]. Such experiments require millikelvin base temperatures, to ensure a thermal magnon-free system [2]. Here, we measured spin-wave transmission at temperatures below 45 mK in a yttrium-iron-garnet (YIG) film on a 500  $\mu\text{m}$ -thick gadolinium-gallium-garnet (GGG) substrate, using a cryogenic propagating spin-wave spectroscopy (PSWS) setup. These experiments revealed an increase of the spin-wave damping due to the paramagnetic GGG substrate, which was further investigated in temperature dependent ferromagnetic resonance (FMR) studies and k-dependent PSWS experiments. The obtained results consolidate the understanding of spin waves at cryogenic temperatures.

### **Theoretical Work**

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