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RF Characterisation of Planar Thin Film Coated Sample

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At Daresbury Laboratory, fast RF characterisation of planar thin film coated samples is being performed on a dedicated facility. It is a LHe-free facility using a 7.8 GHz Choke Cavity to test planar samples 90-130 mm in diameter and 2-10 mm thickness. A simple sample mounting procedure, and straightforward measurements of surface resistance using an RF-DC compensation method, allows this facility to achieve a high throughput of 3 sample tests per week at temperatures from 4.2 K and low peak magnetic fields up to 20 mT. With this facility, mass deposition parameter studies have been performed with Nb, Nb3Sn and NbTiN, and is suitable for other materials such as V3Si, MgB2 and SIS structures. This facility is an easily available step prior to RF testing with more complex sample geometries such as QPR and split cavities, enabling low-effort, thin film optimisation prior to cavity depositions.

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