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A LHe-free test facility for thin film SRF cavity testing

Thursday 25 September 2025 14:30 (3 hours)

A new cryogenic facility for the RF testing of thin film coated SRF cavities has been designed and built at Daresbury Laboratory. This facility uses a pulse-tube cryocooler providing 2.7 W of cooling power at 4.2 K and enables cavity tests at: 1.3, 3, 6 GHz. The cryostat has been constructed and has successfully passed initial vacuum and cryogenic tests. The primary focus of this facility is on testing 1.3 GHz single-cell TESLA cavities. For this, a bespoke conduction cooling system has been engineered to ensure optimal thermal contact despite slight geometric variations between cavities. A new RF system has also been built that can be used for low power continuous wave and pulsed testing across the full range of test frequencies. With a throughput of at least one cavity per week, the facility provides an efficient platform to pre-select cavities before high-power liquid helium testing at 2 and 4.2 K. Details of the design, commissioning and early performance of the facility are reported.

I have read and accept the Privacy Policy Statement

Yes

Footnotes

Funding Agency

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