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M1Or3E-04: [Invited] Critical current stability of 2G REBCO tape for space-flight HTS leads

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High reliability is an essential requirement for all spaceflight hardware. XRISM, a follow-on mission to the Hitomi x-ray observatory, also uses 2G REBCO tapes as current leads for the superconducting magnets that are a key component of the Adiabatic Demagnetization Refrigerator (ADR) that cools the detector array. While the Hitomi Soft X-ray Spectrometer (SXS) worked flawlessly in orbit, during its development there were indications that the critical current of its specialized REBCO tapes could degrade over time when exposed to normal-humidity air. To demonstrate that the updates to the XRISM HTS lead assemblies had mitigated this risk, a series of tests were carried out to measure the stability of I_c of dozens of samples over a period greater than the flight assemblies were exposed to air during integration and test. The test rig allowed not only the measurement of the sample I_c , but also the localization of the voltage rise as the current approached I_c . We will discuss the trends in the critical current of the samples, as well as localization of lower I_c regions.

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