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C4Or1C-02: High Temperature Superconductor Lead Assemblies for XRISM

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The RESOLVE instrument on the upcoming XRISM mission is a rebuild of the SXS instrument that successfully demonstrated high resolution X-ray spectroscopy on the Hitomi mission using a microcalorimeter array at 50 mK. As with SXS, the RESOLVE instrument requires High Temperature Superconductor (HTS) lead assemblies to carry high current to the Adiabatic Demagnetization Refrigerator (ADR) while meeting a very stringent heat conductance budget. For the RESOLVE HTS lead assemblies, we have used new materials and processes to improve the stability and consistency of solder joints to the HTS material. We have also designed a new thermal strap that eliminates stress concentrations on the HTS tapes. We present the results of testing on the engineering model and flight model units, as well as the results of long term testing on prototype solder joints.

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