

CRYOCOOLER COLD FINGER HEAT INTERCEPTOR

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Spacecraft instruments requiring cryocoolers in their design struggle to keep overall power requirements in line with feasible solar array dimensions. Intermediate temperature (150 K to 200 K) radiators to cool radiation shields or optics on spacecraft instruments provide an as yet untapped resource for reducing the cryocooler power requirements.

JPL has demonstrated significant thermal performance improvements to British Aerospace (BAe) cryocoolers by providing passive cooling below 2.00 K along the warm end of the cryocooler cold fingers. Inclusion of the thermal strap to cool the cold finger has resulted in 50 % reductions in cryocooler input power for temperatures near 60 K with no loss in refrigeration capacity. This paper will discuss the heat interceptor test results and the implications on spacecraft instrument design.

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