

CSE Showcase Talk

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How off-the-shelf cryocoolers are used in space applications

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Abstract

Over the recent years, the reliability and robustness of many mechanical cryocoolers has improved to a point where many cost-sensitive infrared instruments for space applications are now using these commercial off-the-shelf (COTS) units for flight.

Both Stirling and pulse-tube coolers are used in such space applications. In this presentation, we will present the developments leading the current cryocooler models that Thales Cryogenics is delivering for this type of missions. We will present the differences in requirements for COTS and 'Full space' cryocoolers and how these differences result in different trade-off results.

We will present an overview of design optimizations and the additional tests and checks that are used for cost-effective validation of flight hardware will be described. Furthermore specific applications of the LPT9510, LPT9310 and LSF9997 cryocoolers in actual missions are presented.

