
SESSION 12: Aerospace Coolers, Drive & Control Electronics

Paper 12.1

Wednesday ORAL Session

2:45 PM

Cryocooler Control Electronics for the Exoplanet Climate Infrared TElescope (EXCITE)

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The Exoplanet Climate Infrared Telescope (EXCITE) is a high altitude, balloon-borne near-infrared spectrometer designed for observation of the planet Jupiter. Cryogenic cooling on the EXCITE spectrometer is achieved with two Thales LPT 9310 cryocoolers. Each LPT 9310 cooler is driven and controlled with a variant of the Creare-West Coast Solutions Miniature Cryocooler Control Electronics (MCCE) designed to strike the right balance between cost, radiation hardness, and robustness for the EXCITE balloon mission. Notably, the EXCITE MCCE includes passive (“set and forget”) and active vibration cancellation options. The design of the MCCE is presented along with test results, including the successful in situ tuning of the vibration control system.