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## **C4Or1C-03: Thermal Design and On-orbit Performance of the ECOSTRESS Instrument**

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J. Cha, B. Carroll, J. Rodriguez, K. Maynard, M. Romero

The ECOSystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOSTRESS) instrument, launched on June 28, 2018, has completed six months of operation in space. ECOSTRESS is a multispectral thermal infrared imaging spectrometer and its primary mission is to investigate and understand how climate change affects water and carbon usage on Earth. The thermal control subsystem consists of a combination of active and passive components to maintain the instrument components within the allowable flight temperature limits. Its focal plane detector is cooled to 65 K by a pair of mechanical cryocoolers and a third mechanical cryocooler cools an intermediate cold shield to 135 K. The waste heat generated by the cryocoolers and electronics, is removed through non-planar cold plates and tube-on plate heat exchanger, which are cooled by a circulating pumped fluid loop inside JAXA's JEM-EF module. The waste heat collected by the JEM-EF is exchanged with a fluid loop that circulates through radiators located on the exterior of the Space Station. This paper provides an overview of the thermal control system architecture, key design drivers, thermal design and analysis approach, and on-orbit thermal performance results.

**Authors:** Dr CHA, Jeff (Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, 91109); Dr CARROLL, Brian (Jet Propulsion Laboratory, California Institute of Technology); Dr RODRIGUEZ, Jose (Jet Propulsion Laboratory, California Institute of Technology); Mrs MAYNARD, Kirsten (Jet Propulsion Laboratory, California Institute of Technology); Mr ROMERO, Memo (MaxQ Technology LLC)

**Presenter:** Dr CHA, Jeff (Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, 91109)

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