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C3Po1F-03: Performance optimization of a 4K hybrid JT cooler for space application

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A 4K hybrid JT cooler is developed to precool the adiabatic demagnetization refrigerator (ADR) of Hot Universe Baryon Surveyor (HUBS) mission which is proposed to study "missing"baryons in the universe. The 4K hybrid JT cooler is composed of a 4He JT cooler precooled by a two-stage thermally coupled pulse tube cooler. Recently, the two-stage pulse tube cooler is optimized to provide more precooling power for the JT loop. The performance of the hybrid JT cooler has been improved and special efforts have been made to optimize the compression system of the JT loop. Eventually, cooling power of 100mW is achieved at 4K which is able to meet the requirements of the ADR of HUBS.

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