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A 150 K High Frequency Micro Pulse Tube Cryocooler

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A micro coaxial pulse tube cryocooler has been developed to meet the space application requirements of high operating temperature infrared detection. To optimize the cooling performance of the cryocooler, the experiments were designed to study the coupling between the compressor and the cold fingers. Driven by a double-piston opposed linear compressor with the mass less than 200 g, this cryocooler uses the inertance tubes and buffer as phase shifter and has the regenerator with a diameter of 10 mm. The effect of the length of regenerator and inertance tube on cooling performance at different frequencies were investigated through a series of experiments. This cryocooler can provide more than 0.5 W at 150 K with a 10 W input electric power. This paper describes the coupling characteristics and presents test data of performance in detail.

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