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C2Po1A-09: Development of the linear Compressor of 152Hz Micro Pulse Tube Cryocooler

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Compressor is the key component of pulse tube cryocooler. It introduces the structure of a linear vibration compressors specifically designed for pulse tube cryocoolers. The paper delves deeply into the impact of compressors on four key aspects: support systems, control systems, compressor efficiency, and vibration and noise reduction. Based on the findings, a compressor weighing 160 grams has been developed, capable of delivering an output power of up to 30W. Furthermore, a micropulse tube cryocooler, coupled with this compressor, operates at a frequency of 152 Hz and provides a cooling capacity of 1.14W with a input power of 10W and a temperature of 150K. Leveraging the design of this compressor, various models have been built and have already undergone mass production for practical applications.

Author: ZHANG, Yuhong (中国科学院理化技术研究所)

Co-authors: CHEN, Houlei (1 Key Laboratory of Technology on Space Energy Conversion, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing 100190, China 2University of Chinese Academy of Sciences, Beijing 100190, China); QUAN, Jia; FENG, Tianshi (Technical Institute of Physics and Chemistry, CAS)

Presenter: ZHANG, Yuhong (中国科学院理化技术研究所)

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