
**SESSION 6: GM & GM-Type Pulse Tube
Cryocoolers**

Paper No. 6-6 Wednesday Morning 10:15 AM

***Low Frequency Stirling Operation of a
Two-Stage 4K Cryocooler without Rotary
Valve Using a Metal Bellows Compressor***

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The energy efficiency of low frequency GM and pulse tube cryocoolers is partially limited by the rotary valve. Moreover, there is a desire to build cryocooler systems with less mechanical parts that might fail or show wear. Pressure Wave Systems started the development of a metal bellows compressor for low frequency Stirling operation of 4K GM and pulse tube cryocoolers without the rotary valve. In this paper we report first results of successfully using a modified version of our commercially available 1kW bellows compressor to directly drive the TransMIT SUSY two-stage pulse tube cryocooler in low frequency Stirling mode at around 2Hz operating frequency. Future work on using this technique with 4K GM cryocoolers will be discussed.