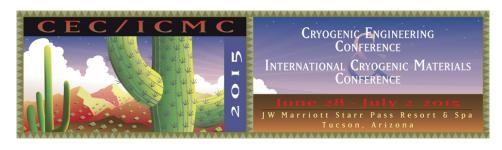
## **CEC-ICMC 2015 - Timetable, Abstracts and Presentations**



Contribution ID: 39

Type: Contributed Oral Presentation

## Study on A Cascade Pulse Tube Cooler with Energy Recovery: New Method for Approaching Carnot

Thursday 2 July 2015 09:00 (15 minutes)

A pulse tube cryocooler can not reach the Carnot efficiency basically because the expansion work must be dissipated at the warm end of the pulse tube, thus the ideal efficiency of a PTC is only Tc/Th, which is less than the Carnot efficiency Tc/(Th-Tc). How to recover this amount of dissipated work is a key to improve the PTC efficiency. A cascade PTC is consisted of PTCs those are staged by transmission tubes in between, it can be a two-stages or even more stages, each stage is driven by the recovered work from the last stage by a well-designed long transmission tube. It's shown that the more stages it has, the closer the efficiency will approach the Carnot efficiency. A two-stages cascade pulse tube cooler working at 233 K is designed, fabricated and tested in our lab, and experimental results show that the efficiency can be improved by 33%.

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