



Contribution ID: 272

Type: **Poster Presentation**

CFD Simulation of the Gas Flow in a Pulse Tube Cooler with two Pulse Tubes

Tuesday, 30 June 2015 09:00 (2 hours)

In order to realize larger and heavier mass supporting without additional supporting components, a new structural pulse tube cooler based on traditional U-shape pulse tube cooler and with one regenerator and two parallel pulse tubes has been proposed. In previous works, two prototypes of U-shape two-pulse-tube paralleled cooler have been designed and tested. In this paper, to help characterize the gas flow in the new structural pulse tube cooler, a two-dimensional axisymmetric Computational Fluid Dynamics (CFD) model is also developed to simulate oscillating fluid flow and heat transfer in the cooler. Results obtained from experiments and CFD simulations are presented and discussed in this paper.

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Session Classification: C2PoE - CFD Modelling and Measurements Techniques

Track Classification: CEC-12 - Fluid Mechanics, Heat Transfer, and Cryogen Properties