



Contribution ID: 481

Type: **Contributed Oral**

C3Or2A-05: Comparison study on a large-scale free-piston Stirling cryocooler

Wednesday 21 May 2025 12:15 (15 minutes)

Large-scale free-piston Stirling cryocoolers, capable of delivering several hundred watts of cooling power at 80 K, have significant potential applications in boil-off gas re-liquefaction and precooling processes. Recently, we proposed a novel parallel regenerator layout aimed at suppressing local acoustic streaming, which could enable further scaling of the cryocooler while maintaining high thermal efficiency. Numerical modeling was performed, and an experimental prototype was developed based on this design. Experimental results demonstrated reasonable agreement with the numerical predictions in terms of cooling power. However, discrepancies in thermal efficiency were observed, likely due to inconsistencies among the individual regenerators.

Authors: YU, Guoyao; Ms MA, Hangyu (Technical Institute of Physics and Chemistry, Chinese Academy of Sciences)

Co-authors: Prof. LUO, Ercang; Mr SUN, Haojie; Prof. DAI, Wei

Presenter: YU, Guoyao

Session Classification: C3Or2A - Remote Cooling and Regenerative Coolers