
**SESSION 10: Stirling & Pulse Tube Cryocoolers -
Experimental**

Paper No. 10-1 Thursday Morning 9:15 AM

***Study of the Flow Resistance through
Regenerator and its Application in a
Stirling Freezer***

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Recently, a Stirling freezer using a regenerator made from wound wire mesh has been tested in our lab. To guide the design of the freezer, the flow resistance through the new regenerator has also been simulated and measured. The paper first generalizes present empirical or numerical formulas from other research on the regenerator flow resistance and makes a systematical comparison between them. The experimental results on the regenerator flow resistance and freezer performance are also reported. With an average charge pressure of 2.5 MPa, the freezer can provide 100 W of cooling power at 235 K with a second law efficiency of 21.4%.