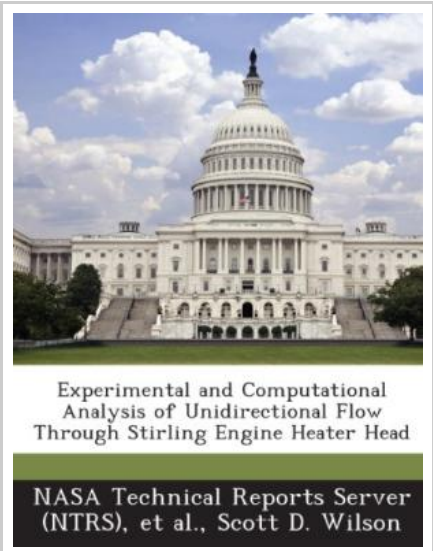


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Experimental and Computational Analysis of Unidirectional Flow Through Stirling Engine Heater Head

By Scott D. Wilson

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 22 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.A high efficiency Stirling Radioisotope Generator (SRG) is being developed for possible use in long-duration space science missions. NASA s advanced technology goals for next generation Stirling convertors include increasing the Carnot efficiency and percent of Carnot efficiency. To help achieve these goals, a multi-dimensional Computational Fluid Dynamics (CFD) code is being developed to numerically model unsteady fluid flow and heat transfer phenomena of the oscillating working gas inside Stirling convertors. In the absence of transient pressure drop data for the zero mean oscillating multi-dimensional flows present in the Technology Demonstration Convertors on test at NASA Glenn Research Center, unidirectional flow pressure drop test data is used to compare against 2D and 3D computational solutions. This study focuses on tracking pressure drop and mass flow rate data for unidirectional flow though a Stirling heater head using a commercial CFD code (CFD-ACE). The commercial CFD code uses a porous-media model which is dependent on permeability and the inertial coefficient present in the linear and nonlinear terms of the Darcy-Forchheimer equation. Permeability and inertial coefficient were calculated from unidirectional flow test data. CFD...

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