

Master's Thesis Defense Announcement
Mechanical and Aerospace Engineering Department
University of Texas at Arlington

USING NUMERICAL MODELING TO DETERMINE VISCOUS LOSSES
WITHIN HELIUM TURBOMACHINERY

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[Microsoft Teams Link](#)

Abstract

Using helium as the working fluid with nuclear power plants has the potential to increase efficiencies while reducing the risk of radioactive contamination.

However, the performance of turbomachinery using helium must be evaluated before its use can be implemented.

To do this, Balaji and Wilson [Analytical Modeling of Helium Compressor Performance," AIAA Paper 2016-4958, July 2016, <https://doi.org/10.2514/6.2016-4958>] developed a code, "HeComp", to estimate the performance of a helium compressor. In this code, the flow is treated as inviscid and analytic models are used to estimate the compressor pressure losses.

The present study utilized a Navier-Stokes solver, FUN3D, to predict the viscous pressure losses more accurately and compare the results to those of the "HeComp" code. The findings show that the pressure losses presented by the "HeComp" code are marginally larger than those calculated in this study.