

Abstract Submitted
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Study of Thermo-Acoustic Instabilities in a Rijke Tube Without and With Porous Inert Medium¹ CODY OSMER, Shelton State Community College, AJAY AGRAWAL, University of Alabama — Porous inert medium has been used in the past to reduce combustion noise in atmospheric pressure systems. It is envisioned that this same approach could be used to mitigate combustion instabilities encountered in gas turbines using lean premixed combustion concept. In this study, a simple Rijke tube is used to investigate the effect of porous inert media on thermo-acoustic instabilities. The Rijke tube set up utilizes a simple tube with a localized heat source. Sound pressure level measurements are taken at the tube exit to determine the sound power spectra in decibels. Such measurements were taken without and with porous medium inserted within the Rijke tube. The porous media is a 2.54 cm thick ceramic disk with 10 to 20 pores per inch. Results show that the Rijke tube behavior without the porous media follows the trends observed by previous investigators. The porous media was effective in reducing the sound pressure level, and thus, it offers the potential to mitigate thermo-acoustic instabilities through proper geometric design.

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