

Abstract Submitted
for the DFD19 Meeting of
The American Physical Society

Structure of thermoacoustic modes in can-annular combustion systems JONAS MOECK, Norwegian University of Science and Technology, GIULIO GHIRARDO, MIRKO BOTHIEN, Ansaldo Energia Switzerland — Large gas turbines for power generation employ a can-annular combustor architecture. In contrast to annular combustors, in a can-annular system, the flames are isolated and burn in individual cans; however, there is acoustic communication between adjacent cans at the turbine inlet through a small gap. The thermoacoustic modal structure of a can-annular combustor significantly differs from that of the extensively studied annular combustor. We consider a can-annular configuration as a system composed of weakly coupled, nominally identical subcomponents. This provides a consistent framework for studying the spectral properties and explains prevalent phenomena in these systems, such as eigenvalue clustering, and mode localization when the symmetry is perturbed. Based on a generic can-annular model system, we illustrate the general modal structure and derive the equivalent downstream boundary condition that links the multi-can resonances to a single-can model.

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Date submitted: 01 Aug 2019

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