

Abstract Submitted
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Dynamic behavior of thermoacoustic combustion oscillations in a lean premixed gas-turbine model combustor with and without active control RYOSUKE TSUJIMOTO, SHOHEI DOMEN, YUTA OKUNO, YOSHITAKE NAKAGAKI, HIROSHI GOTODA, Ritsumeikan University — We experimentally study the dynamic behavior of thermoacoustic combustion oscillations in a laboratory-scale lean premixed gas-turbine model combustor with and without active control. We adopt the delayed feedback control method based on the concept of chaos control to suppress thermoacoustic combustion oscillations. The unstable periodic orbits in the attractor of uncontrolled thermoacoustic combustion oscillations are led to the desired orbits with a small diameter of the attractor when the perturbation is switched on, resulting in the notable suppression of thermoacoustic combustion oscillations. Color-recurrence plots (Gotoda et al., *Physical Review E*, **89**, 022910 (2014)) are used for characterizing the complexity of the combustion state with and without delayed feedback control.

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