



Model-Based Self-Tuning Multiscale Method for Combustion Control

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BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 26 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. A multi-scale representation of the combustor dynamics was used to create a self-tuning, scalable controller to suppress multiple instability modes in a liquid-fueled aero engine-derived combustor operating at engine-like conditions. Its self-tuning features designed to handle the uncertainties in the combustor dynamics and time-delays are essential for control performance and robustness. The controller was implemented to modulate a high-frequency fuel valve with feedback from dynamic pressure sensors. This scalable algorithm suppressed pressure oscillations of different instability modes by as much as 90 percent without the peak-splitting effect. The self-tuning logic guided the adjustment of controller parameters and converged quickly toward phase-lock for optimal suppression of the instabilities. The forced-response characteristics of the control model compare well with those of the test rig on both the frequency-domain and the time-domain. This item ships from La Vergne, TN. Paperback.

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