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Dynamical behavior of flame front instability induced by radiative heat loss HIROSHI GOTODA, TAKUYA IKAWA, KOSHIRO MAKI, TAKAYA MIYANO, Ritsumeikan University — Exploring complexities in flame front instability leading to flame extinction is of current interest in combustion physics and nonlinear science. We investigate the dynamical properties of the flame front instability induced by radiative heat loss using nonlinear forecasting. The flame front instability represents high-dimensional chaos generated via the period-doubling cascade process, while its short-term behavior is predictable using a local nonlinear predictor based on the Sugihara-May method (G. Sugihara, R. M. May, *Nature* 344, 734 (1990), H. Gotoda et al., *Chaos* 22, 033106, (2012)). The feasibility of a new approach based on short-term prediction is also discussed in this work from the practical viewpoint of combustion systems.

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