

Abstract Submitted  
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**Numerical simulations of flame balls using an adaptive wavelet method**<sup>1</sup> DAMRONGSAK WIRASAET, SAMUEL PAOLUCCI, University of Notre Dame — Adaptive algorithms are important for accurate and efficient numerical simulation of multi-dimensional physical problems whose solutions contains a wide range of spatial scales that may evolve with time. In this work, we use an adaptive wavelet method to solve such problems involving reactive flows. The adaptive method takes advantage of an interpolating wavelet for the adaptive approximation in the design of a simple refinement strategy that reflects the local demands of the physical solution. The derivative approximation is computed via a consistent finite-difference approximation on an adaptive irregular grid. To demonstrate the versatility and efficiency of the method, flame ball problems, whose evolving scales are controlled by different parameters, are simulated.

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