

Abstract Submitted  
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**Asymptotic study of flow in reactive microchannels** MARK SHORT, Los Alamos National Laboratory, DAVID KESSLER, Naval Research Laboratory — The influence of thermal expansion on the dynamics of thick premixed flames (flame thickness less than the channel height) for a variable density flow in a narrow, rectangular channel or pipe is explored. Adiabatic, non-adiabatic and axial heat conducting channel walls are considered. In each case, small Peclet number asymptotic solutions are developed for steady variable density flame propagation in the narrow channel. Configurations including flame propagation from the closed to the open end of the channel, toward the closed end of the channel, and toward the channel inlet where a Poiseuille flow (flame assisting or flame opposing) is imposed are studied. Finally, comparisons of the finite Peclet number dynamics are made with the behavior of the small Peclet number solutions.

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