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Premixed flames with complex chemistry as gasdynamic discontinuities[1] YVAN BRONNER, ANDREAS G. CLASS, Forschungszentrum Karlsruhe, Germany, KARIN KOENIG, ULRICH MAAS, Karlsruhe University, Germany — Recently, Class, Matkowsky & Klimenko (JFM 491, 2002) proposed a model where a premixed flame is described as a gasdynamic discontinuity separating the burned and unburned gases. In the model a flame speed relation (pde) replaces the energy and mass conservation equations. The parameters in the flame speed relation account for the reaction mechanism and fluid properties. Explicit expressions have been derived for one-step high activation energy reaction kinetics. We now obtain quantitative parameters from 1D detailed flame structure simulations. We present both the modelling approach and numerical simulations of an unsteady premixed flame with inhomogeneous mixture composition.

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