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Heat release in freely-propagating lean premixed hydrogen-methane mixtures XINFENG GAO, MARCUS DAY, JOHN BELL, Lawrence Berkeley National Lab — Freely-propagating lean premixed hydrogen-air flames are thermo-diffusively unstable and burn in localized regions of intensified reaction. The flames propagate by the "active species-diffusion" mechanism, rather than the "thermal propagation mode" adopted by lean methane mixtures. We are interested in understanding mechanisms potentially explaining the influence of hydrogen on the flame structure of hydrogen-methane-air flames. The combustion behavior of hydrogen-methane fuel mixtures is then described with a set of relations derived from the heat release structures. The heat release characteristics of freely propagating flames resemble those of flat steady flames across a broad range of inlet fuel mixtures.

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