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Science Results from Ground Based Research (4)

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EXTERNAL HEAT SOURCE PHENOMENON AND FIRES

Abstract

Through proper experimentation, the effect of External heat source(s) on spreading of flames is investigated in the aid of spread rate. The imperative nature of fire safety in space propulsion and assisted ground facilities have necessitated active research efforts into the fundamental understanding of the mechanisms which controls its propagation. A propagating fire assisted with external heat source(s) have been understood as the cause of major disasters. Flame spread rate is a direct implication of forward heat transfer from burning to non-burning region. As an external influence, heat source(s) alter the heterogeneous heat and mass transfer with modified localized temperature and velocity fields around the pilot fuel thus affecting the forward heat transfer reflected in fire spreading rates.

Present work is motivated by the need to have superior fire safety standards for wide range of propulsive, engineering, industrial,and practical applications. External heat source phenomenon is detailed by means of enhanced understanding of the mechanisms which controls the spread rates under different operating conditions.An experimental setup is upraised comprising of a paraffin wax candle as pilot fuel and marked incense sticks as external heat source. The location and configuration(s) of source is systematically varied keeping the ignition front fixed for applications needing fast spreading and flame extinction.