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Curvature effects on detonations with mole decrement reactions VIKTOR GORCHKOV, MARK SHORT, TAM, UIUC —

We analyze the structure and stability of weakly curved, quasi-steady, self-sustaining detonations having a one-step, non mole-reserving chemical reaction. For a steady planar detonation, a sufficiently large mole decrease during the reaction causes the rate of heat release by chemical reaction to reach a maximum at a point of incomplete reaction. It is this feature which allows the construction of quasi-steady, weakly curved, converging detonation solutions, in addition to the previously identified diverging wave solutions. We construct the quasi-steady detonation velocity against front curvature relationships for converging waves with mole-decrement reactions. The stability of such solutions is investigated by direct numerical simulation of the imploding detonations

Prefer Oral Session
 Prefer Poster Session

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