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Evaluation of XHVRB for Capturing Explosive Shock Desensitization[1] LEAH TUTTLE, ROBERT SCHMITT, DAVE KITTELL, ERIC HARSTAD, Sandia National Laboratories — Explosive shock desensitization phenomena have been recognized for some time. It has been demonstrated that pressure-based reactive flow models do not adequately capture the basic nature of the explosive behavior. Historically, replacing the local pressure with a shock captured pressure has dramatically improved the numerical modeling approaches. Models based upon shock pressure or functions of entropy have recently been developed. A pseudo-entropy based formulation using the History Variable Reactive Burn model, as proposed by Starkenberg, was implemented into the Eulerian shock physics code CTH. Improvements in the shock capturing algorithm were made. The model is demonstrated to reproduce single shock behavior consistent with published pop plot data. It is also demonstrated to capture a desensitization effect based on available literature data, and to qualitatively capture dead zones from desensitization in 2D corner turning experiments. This models shows promise for use in modeling and simulation problems that are relevant to the desensitization phenomena. Issues are identified with the current implementation and future work is proposed for improving and expanding model capabilities.

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