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Detonation Failure Characterization of Non-Ideal Explosives¹ ROBERT JANESHESKI, STEVEN SON, LORI GROVEN, Purdue University — Non-ideal explosives are currently poorly characterized, which limits the modeling of them. Current characterization requires large-scale testing to obtain detonation wave characterization for analysis due to the relatively thick reaction zones. Use of a microwave interferometer applied to small-scale confined experiments is being implemented to allow for time resolved characterization of a failing detonation. The microwave interferometer measures the failing detonation wave in a tube, and this experiment only requires small amounts of non-ideal explosives. A non-ideal explosive is initiated with a booster charge and a measurement of the failure distance and a continuous position-time trace of the detonation front location can be obtained. Initial tests have been performed that show this method is feasible using an ammonium perchlorate (AP) composite propellant as a model non-ideal explosive. Future work will apply this approach to non-ideal explosives. Successful results of this method would allow for the calibration of detonation models for many different non-ideal explosives.

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