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A study of shock initiation experiments for the explosive PBX 9502 using three reactive burn models MATTHEW PRICE, Los Alamos National Laboratory — Shock to detonation transition (SDT) experiments are essential in calibrating and validating reactive burn models for explosives. This work investigates the large collection of SDT test data for the explosive PBX 9502 at ambient temperature that was presented by Gustavsen, Sheffield, and Alcon [Journal of Applied Physics, 99, 114907 (2006)]. We first analyze the experimental data and compare two different methods of determining the shock transition time/distance (namely, the bi-linear method and the single curve method). This reveals some of the uncertainty in estimating shock transition points, which contributes to scatter in Pop plot data. Next, we compare the WSD, AWSD, and SURFplus reactive flow models for a collection of approximately 20 experimental shots using the FLAG hydrocode. Error estimates are used to quantify how well each reactive flow model (and their respective parameter calibrations) performs at predicting the SDT process for a range of loading conditions. Additionally, the importance of mesh resolution and numerical dissipation in SDT simulations will be assessed.

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