

Abstract Submitted
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High Explosive Shock Initiation Model Based on Hot Spot Temperature¹ LAURENCE FRIED, MATTHEW KROONBLAWD, Lawrence Livermore Natl Lab — We describe a new shock initiation model based on the Cheetah thermochemical code. The model is based on a multiple stage picture of the shock initiation process and uses hot spot temperature as an auxiliary variable to control the initial stages of reaction. Unlike using rates controlled by other thermodynamic variables, this approach captures physical sub-zonal differences between the bulk temperature and the substantially higher local hot spot temperature that actually governs ignition chemistry. In the model, a single representative hot spot diameter is chosen and the hot spot temperature is controlled by shock pressure and thermal conductivity. The practical utility of a sub-zonal hot spot temperature model will be discussed, as well as evidence for co-existing hot spot and shear band ignition mechanisms in high explosive shock initiation.

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