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**Modeling anisotropic sensitivity in pentaerythritol tetranitrate using strain rate dependent reactive flow model**[1] KIHONG KIM[2], LLNL & Seoul National University, LAURENCE E. FRIED, LLNL, JACK J. YOH, Seoul National University — Initiation of detonation in some high explosives has shown strong anisotropic sensitivity under mechanical impact. Preferred directions of crystal orientation on shock initiation have been experimentally observed in pentaerythritol tetranitrate (PETN), which resulted in dramatic difference in the detonation sensitivity upon shock compression in different directions. The ignition and growth model based on empirical observation on the pressure-dependent initiation of detonation has been widely used to date. Since the model is independent of direction of compression, it is impossible to address sensitivity associated with preferred crystal orientation for establishing the go/no-go criteria. In this paper, we have proposed a new reaction flow model that is consistent with avaialble PETN experiments and atomistic calculations. A general tensor notation is utilized to fully address three-dimensional effect of the strain rate dependence to anisotropic detonation of PETN.

[1]K. Kim was supported by post-doctoral research fellowship from the National Research Foundation of Korea
[2]Visiting Research Fellow of LLNL & Post doctoral Fellow of Seoul National University

Jack J. Yoh
Seoul National University

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