STUDY OF SHOCK INDUCED ACETYLENE COMBUSTION USING IN-FINITE RATE REACTION MODEL

F. Togashi¹, R. Löhner², J. D. Baum³, O. A. Soto⁴, J. Bell⁵

^{1*} Applied Simulations Inc., 10001 Chartwell Manor Ct., Potomac, MD 20854, USA;
² George Mason University, 4400 University Dr., Fairfax, VA 22030, USA;
³ Applied Simulations Inc., 10001 Chartwell Manor Ct., Potomac, MD 20854, USA;
⁴ Applied Simulations Inc., 10001 Chartwell Manor Ct., Potomac, MD 20854, USA;
⁵ Defense Thread Reduction Agency, Fort Belvoir, VA 22060, USA

ABSTRACT

We developed a fast computational fluid dynamics (CFD) code to handle a shock induced combustion of an acetylene (fuel gas) using the infinite rate reaction model. The developed code successfully simulated shock induced acetylene combustion in an experimental chamber in reasonable computational time. We also investigate the effect of sub-grid modeling in the event.