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Characterisation and Modification of Thermally Stable High Explosives for Laser Flyer Applications ADAM PARKER, University of Cambridge, Madingley Road, Cambridge, CB3 0HE, UK, ROBERT CLARIDGE, QinetiQ Ltd, Fort Halstead, Sevenoaks, Kent, TN14 7BP, UK, WILLIAM PROUD, University of Cambridge, Madingley Road, Cambridge, CB3 0HE, UK — Laser initiation offers improved weapon survivability, versatility and greater IM compliance. Detonators based on laser-driven flyers are less vulnerable to electrical initiation, and can be based on insensitive secondary explosives rather than sensitive primary explosives. Additionally, this technology will offer advantages in terms of improved flexibility and reliability. Several novel energetic materials were selected for investigation at QinetiQ. The materials are of interest due to their increased thermal stability and power output over conventional explosives. These properties promote the materials as ideal candidates for use in insensitive munition compliant applications, whilst also improving performance. The response of these materials to short duration high-amplitude shock impulses by laser-driven flyers was investigated. Preparation techniques including co-crystallisation, sonication and incorporation of additives were used to sensitise the materials to flyer impact, yet maintain their insensitivity to external hazards. Hazard characterisation was performed to ensure that no detrimental effects were caused by modification.

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