# COMPARISON OF NUMERICAL ANALYSIS WITH OUTPUT FROM PRESCISION DIAGNOSTICS DURING NEAR-FIELD BLAST EVALUATION

M.J. Whittaker[1], A. Klomfass[2], I.D. Softley[1], D.J. Pope[1], A. Tyas[3]

*[1] Physical Sciences Group, Platform Systems Division Dstl Porton Down, Salisbury, Wiltshire SP4 0JQ , United Kingdom*
*[2]Fraunhofer-Institut für Kurzzeitdynamik, Ernst-Mach-Institut (EMI), Branch Safety, Am Klingelberg 1, 79588 Efringen-Kirchen, Germany*
*[3]Blastech Ltd, 40 Leavygreave Road, Sheffield, S3 7RD, UK.*
*&*
*Department of Civil and Structural Engineering, University of Sheffield Mappin Street, Sheffield, S1 3JD, UK*

**Key words :** Choose 5 key words Near-field blast, Modelling, Experiments

Both accurate experimental characterisation of blast loading in the near-field (scaled distance <<1m/kg$^{1/3}$) and the modelling of these events remain significant challenges. Over the past 5 years, a collaboration between the University of Sheffield (UoS), the UoS spin-out company Blastech Ltd, and the UK MoD Defence Science and Technology Laboratory (dstl) has made led to the development of the Characterisation of Blast Loading (COBL) facility to enable measurement of spatial and temporal variations of normally and obliquely reflected blast pressures at scaled distances down to ~0.15m/kg$^{1/3}$. These tests involve the detonation of 100-200g spherical charges of PE4 and PE10 explosives close to a nominally rigid target surface, instrumented with an array of Hopkinson Pressure Bars. More recently, work has been conducted to appraise the ability of high-fidelity, physics-based numerical codes to predict the mechanisms and magnitudes of the loading seen in the experimental tests. This paper presents experimental data and numerical simulation of the tests using the CFD (Computational Fluid Dynamics) code APOLLO, developed by Frauenhofer-EMI. Comparisons are made between simulations using and not using afterburn functionality and investigations are presented into the use of modified JWL parameters.