RECENT DEVELOPMENT AND RESEARCH AT THE UNIVERSITY OF SHEFFIELD BLAST LAB IN BUXTON, UK

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Abstract:
The Blast and Impact Dynamics lab in Buxton, UK has recently undergone a significant refurbishment due to investment by the University of Sheffield and funding from the Engineering & Physical Sciences Research Council (EPSRC) through a Strategic Equipment Grant. This has complimented development in measurement techniques funded through standard EPSRC grants and commercial blast testing undertaken by Blastech Ltd. a spin out company of the University of Sheffield.

This paper aims to discuss some of the recent developments that have been undertaken and introduce some of the technical work that this has enabled.
In summary, the recent developments include:

- Full site refurbishment
- Construction of a blast chamber rated to withstand 1kg TNTeq
- State-of-the-art split Hopkinson pressure bar lab
- Improved diagnostic equipment
    - 2x Shimadzu HPV-X2 high speed cameras
    - Digital image correlation software
    - 4 Channel 150kV Flash x-ray system
    - Telops FastM1k MWIR thermal camera
    - High speed pyrometer [1]
    - Mechanisms and Characterisation of Explosives apparatus (MACE) [2]
    - Underwater explosives testing facility
    - Modular confined blast test chambers

The second part of the paper will discuss how this has transferred into research outcomes and opportunities it presents for future collaboration.

[1] Hobbs, M. & Barr, Andrew & Woolford, Scott & Farrimond, Dain & Clarke, Sam & Tyas, Andrew & Willmott, Jon. (2022). *High-Speed Infrared Radiation Thermometer for the Investigation of Early Stage Explosive Development and Fireball Expansion*. In *Sensors*. 22. 6143. 10.3390/s22166143.
[2] Barr, Andrew & Rigby, Sam & Clarke, Sam & Farrimond, Dain & Tyas, Andy. (2023). *Temporally and Spatially Resolved Reflected Overpressure Measurements in the Extreme Near Field*. In *Sensors*. 23. 964. 10.3390/s23020964.