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Investigation of dynamic failure properties of biological materials to model human soft tissues in primary blast injury JAMES LEE, DANYAL MAGNUS, Department of Physics, Imperial College London, DAVID SORY, Department of Physics/Centre for Blast Injury Studies, Imperial College London, MANSOOR KHAN, Department of Surgery and Cancer, Imperial College London, WILLIAM PROUD, Department of Physics, Imperial College London, INSTITUTE OF SHOCK PHYSICS COLLABORATION — Understanding the dynamic failure properties of soft tissues under high strain-rate is fundamental to the characterization of human organs under blast loading that leads to primary blast injuries. As organs, such as the gastrointestinal tract, are composed of soft tissues of varying properties and composition, it is necessary to identify the suitable proxy that sufficiently models these characteristics and test their behaviour under blast loading. This study aims to investigate the dynamic failure properties of natural and synthetic soft biological materials using the Shock Tube and the Split-Hopkinson Pressure Bar (SHPB) with the aims to establish a sufficient background for the development of a model that will replicate *in vivo* conditions. An overview of methods of blast loading on samples will be presented, including the two-gauge measurement method on the SHPB, to address the longer loading duration requirement for the soft materials to reach stress equilibrium. The outcome of the study will illustrate the effectiveness of the data analysis using the proposed measurement methods. A comparative overview of the behaviour of different specimen will be outlined and the suitability of these materials as a proxy for the real organs will be discussed.

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