EVALUATION OF LOWER-COST IN-TARGET STRESS MEASUREMENTS

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Projectile penetration and explosive testing are often conducted using concrete or rock targets. It is highly desirable to perform companion High-Performance Computing (HPC) simulations of these events in order to investigate the physical processes taking place, and to augment the experimental database. Measurement of the stresses induced in the experiment targets by the explosion or penetration events provides a reliable means of verifying the performance of the HPC simulations. Unfortunately, stress measurements in concrete or rock tend to be rather expensive due to the high cost of the rugged, precision sensors required. In order to address this issue an effort was undertaken to produce and evaluate stress sensors suitable for measurement of concrete or rock stresses in the 0.5 to 2.0 kbar regime. This paper describes the overall effort, including the selection and design of the carbon-element and PVDF-element flatpack stress sensors and carbon-resistor stress transducers evaluated, the explosive testing, and performance comparisons of the different stress sensors.

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