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Digital image correlation applied to shock loading of structural materials[1] PAUL HOOPER, HARI ARORA, AMIT PURI, BAMBER BLACKMAN, JOHN DEAR, Department of Mechanical Engineering, Imperial College London, SW7 2AZ, UK — Shock loading of structural materials is an important design consideration in many civil and military engineering applications. Integrating digital image correlation with high-speed photography has allowed for detailed analysis of high-rate events. This technique has been applied to laminated glass and glass fibre sandwich composite panels loaded by an air blast. A speckle pattern was applied to each panel of approximately 1.8m^2 and these were photographed at 1,000 frames per second using two high-speed cameras. The analysis has allowed for the measurement of full-field displacements in all three-dimensions and in-plane strains, aiding the verification of material models as well as giving an improved understanding of the failure mechanisms under blast loading.

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