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Perturbations Caused by Lateral Stress Gauges RON WINTER, ERNIE HARRIS, AWE, Aldermaston, UK — In principle, stress gauges mounted to measure lateral stresses in a shocked matrix allow the shear strength of the material to be determined. Interpreting the records from lateral stress gauges is hindered by the fact that the stress field in the insulating layer in which the gauges are mounted can differ significantly from the stress field that would be generated in the sample if no gauge were present. A series of high resolution Eulerian code calculations have been run which suggest that the stresses in the insulating layer vary with distance and time in a way that depends on the thickness of the layer, the shock strength, and the elastic and plastic properties of both the layer and the matrix. In particular, if the shock velocity in the matrix material is high the stress at a typical gauge position initially rises to a sharp peak then falls with time, but when the shock velocity in the matrix is low the stress rises relatively gradually throughout the time of interest. The shapes of the stress-time profiles predicted by the hydrocode compare well with the results of lateral gauge experiments on several different materials.

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