Calculating the resistance of lateral gauges in a steel matrix.
ERNIE HARRIS, RON WINTER, AWE, Aldermaston, Reading, UK — High resolution computer simulations of manganin gauges mounted to measure lateral stresses in a steel matrix subject to nominally 1-D shock have been run. The components of the stress and strain tensors for each of the cells in the manganin element have been obtained from the code. Piezo-resistive and plastic strain coefficients derived by previous workers have been used to compute the resistivity of each cell in the gauge and, ultimately, the total resistance change of the gauge. Calibration curves relating resistance change to a) stress in the polymer surrounding the gauge and b), the stress in the sample material remote from the gauge, are derived and compared with a similar relationships derived by previous workers.

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