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Effects observed when using metallic flyers and barriers with the embedded particle velocity gauge technique MICHAEL GOFF, GARETH APPLEBY-THOMAS, Cranfield University, MALCOLM BURNS, AWE, PAUL HAZELL, University of New South Wales, RICK GUSTAVSEN, LANL, CHRIS STENNET, Cranfield University — A number of experiments were carried out using a modified version of the standard particle velocity gauge technique in plate impact experiments with inert targets. Unusually these utilised metallic flyer plates. Traditional methodology advises against the use of metallic flyers/barriers with this technique, additional conductive objects moving in the magnetic field produce perturbations in the output gauge voltage. This body of work investigated the causes of the perturbation effect, methods of minimising its magnitude and possible postprocessing correction methods. In experiments with Al flyers, perturbations on the order of 15% of signal strength were observed. While the magnitude of the voltage traces were distorted, key features such as shock impact could still be observed, and shock trackers were still effective. Mitigating techniques such as laminated flyers and were tried and reduced the perturbation effect, but adversely affected the shock input produced. The case of metallic barriers was also examined and similar effects observed. This study has indicated that while a coarse empirical correction is possible, uncertainty in the validity of the correction would preclude against the use of metallic flyers in experiments where high fidelity data is required.

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