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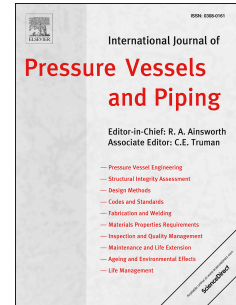
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## Assessment of Welding-Induced Plasticity via Electron Back-Scatter Diffraction

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### Abstract

Electron backscatter diffraction (EBSD) has been used to obtain orientation maps across a multi-pass slot weld in austenitic stainless steel plate. Spatially-resolved intragranular misorientation analyses have been performed, and a relationship between lattice misorientation and accumulated plastic strain has been used to quantify welding-induced plasticity. Qualitative features are captured across multiple length scales. Quantitative accuracy is demonstrated by comparing the misorientation-based analysis to complementary hardness-based measurements, as well as numerical predictions obtained using computational weld mechanics. The shortcomings of the present misorientation analysis and the underlying assumptions made are discussed.

*Keywords: Electron backscatter diffraction; misorientation; plasticity; welding*

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