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(57) Abstract :
EXPLOSIVE WELDING TECHNIQUE ENHANCED BY NEURAL NETWORK OPTIMIZATION FOR DISSIMILAR METAL BONDING The method for the development of the explosive welding is an advanced solid-state bonding technique widely used for joining dissimilar metals, offering unique advantages such as high bonding strength and minimal heat-affected zones. The integration of neural network optimization into explosive welding for enhanced control and prediction of bonding outcomes. By leveraging machine learning algorithms, particularly neural networks, we analyze large datasets of welding parameters including explosive load, flyer plate velocity, and stand-off distance alongside material properties, to predict and optimize the bonding quality. The neural network model is trained to identify patterns and relationships between input variables and the resulting weld integrity, including factors such as bond strength, interfacial morphology, and defect formation. Experimental validation of the neural network-optimized parameters demonstrates significant improvements in bond quality, reduced defects, and enhanced process efficiency. FIG.1

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