

"Weld Pool Shape Modeling of Laser Assisted Arc Welding"
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invited seminar to be presented at IFSW, University of Stuttgart
Stuttgart, Germany, Oct. 8, 2001

The welding research program on hybrid laser-arc welding in the welding group in the Metals and Ceramics Division at ORNL will be reviewed. This is a joint project with three other national laboratories. ORNL's role has been to model the weld pool shape behavior as a function of weld parameters. This has been accomplished by using a neural network model to predict specific weld pool shape parameters and then use these parameters to predict the overall weld profile. The model has proven to be very successful. It captures the trends found in weld pool shape as a function of welding conditions such as weld speed, laser power, and so on. It has provided an understanding of the response of weld penetration depth and weld pool size to changes in welding conditions. Plans for extending this model to include the prediction of weld properties, and in particular, the spatial variation in hardness, will also be discussed.

This research is sponsored by the Office of Industrial Technologies, Office of Energy Efficiency and Renewable Energy, U. S. Department of Energy, under contract DE-AC05-00OR22725 with UT-Battelle.