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## **Modeling of axis-symmetrical welding distribution of torque for underwater arc welding**

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Different external electromagnetic influences on the flows of molten metal in the weld pool play an essential role in ensuring the quality of welded joints in the aquatic environment.

We consider an integral axis-symmetrical model of a welding torque distribution by the arc welding of gap in the plate. We divide our modeling on two stages: in the first stage we solve the system of integral equations for the charges on the surfaces of electrodes and on the contact domains of surfaces with different conductivity; in the second stage we find the density of a torque at any point of conductor by the obtained distribution of charges.

The possibility of such modeling is an important advantage of the proposed model compared with the finite-difference and finite-element models. With latest models, as is known, the distribution of the magnetic induction is computed over the entire space, while there is no necessity of such full information in the most cases.