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P4.096 Ultrasonic C-scanning technology application for low-temperature superconducting joint box material of ITER current lead

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The low-temperature superconducting (LTS) joint box is an important part of ITER HTS current leads. Enabling to provide the required functionality, the LTS joint boxes are made out of Copper-316L bi-metallic explosion plates. The bimetal interface of the joint has the direct effect on the mechanical properties of the joint and testing performance at low temperature. For this reason, the interface of the material must be of the highest quality without internal flaws.

This paper describes work on the development of water immersion ultrasonic C-scanning technology, and its application on bi-metallic explosion plate. It also give a comparing results on detecting the line segments and arc segments from copper side by using single crystal focusing probe and linear phased array probe. Assessment criteria were defined by analyzing signals which is produced by interface and the defects. Experimental results indicate that the method can meet the requirement as mentioned that the absence of defects of area greater than 2mm² in the final box should be confirmed.

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