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P4.103 Experimental study on anti-fatigue performance for TIG Welding and EB welding of RAFM steel plate

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The Reduced Activation Martensitic/Ferritic steel (RAFM steel) is known as one of the most important materials for future fusion reactor blanket and the welding process is unavoidable for blanket structure, so it is extremely necessary to research his welding performance. Some simulations and experiments about anti-fatigue of RAFM steel welding specimens have been done in this paper. The anti-fatigue simulation of tungsten inert gas (TIG) welding and electron beam (EB) welding of RAFM steel was carried out by using ANSYS. The anti-fatigue performance for two types RAFM steel specimens of TIG welding and EB welding were also tested by SDS200 electro-hydraulic servo fatigue testing machine. The anti-fatigue of the weld joint both on TIG welding and EB welding was tested by applying the same gradient load. The experimental results were studied to analyze the impact of fatigue resistance for different welding forms of RAFM steel. It can provide some beneficial reference for the blanket design of china fusion engineering testing reactor (CFETR) in the future.

Presenter: LIU, Sumei (School of Engineering Anhui Agricultural University)

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