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P3.107 Heat Flux Uniformity Qualification for First Wall Panel Prototype

Wednesday, 19 September 2018 11:00 (2 hours)

The ITER first wall panels are exposed directly to thermonuclear plasma and must extract heat loads of about 2 MW/m² (Normal Heat Flux) to 4.7 MW/m² (Enhanced Heat Flux). The manufacturer of the normal heat flux first wall panels shall be qualified through deep high heat flux cyclic testing campaign counting thousands of cycles within the heat flux range up to 2.5 MW/m². To ensure correct testing conditions and confirm possible damage evolution during individual cycles, the heat flux must be applied as much uniformly as technically achievable. Uniformity of the heat flux application was measured on a castellated graphite plates by using infrared cameras and set of thermocouples in defined locations and checked on flat copper mock-up via X-ray imaging. Experimental tests of the applied heat flux show promising results reaching high uniformity of the electron beam irradiation and, thus, high uniformity of applied heat flux on the surface of testing sample. Uniformly applied heat flux can be then considered as qualified and ready for its application on the first wall prototype testing campaign.

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