

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Investigation on a new method to in-situ distinguish the deposition tile with the junction defect tile LAIZHONG CAI, JIAN LIU, Southwestern Institute of Physics, ERIC GAUTHIER, YANN CORRE, Association Euratom - CEA, SWIP COLLABORATION, CEA IRFM COLLABORATION — The behaviors of plasma facing components(PFC) are major concerns for tokamaks, in particular, for steady state operations. Some PFC tiles show abnormal high surface temperature than others when thermal steady state is reached, which is believed to be caused by the deposition layer on the tile or the junction defect of the sandwich PFC tile. Although carbon deposit tiles and junction defect tiles present similar thermal response, the deposition layer and junction delamination have different effects to the tile lifetime. Delamination could bring a critical failure of the tile and then influence the steady state operation. The defect tile needs to be replaced before failure although the replacement is difficult, whereas the deposition tile does not impact on the PFC lifetime and easy to be cleaned. Therefore, trying in-situ to distinguish deposited tiles and junction defect tiles is crucial to avoid a critical failure. More, the junction defect is related to not only repetitive heat pulses but also manufacture. It is possible a junction defect tile exists in the deposition area or even both junction defect and deposition layer appear on the same tile. This makes the discrimination more complicated and obligatory. In this paper, thermal behaviors of junction defect tiles and carbon deposit tiles are simulated. A modified time constant method is introduced and then the feasibility of discrimination by analyzing the thermal behaviors of tiles is discussed. Requirements of this method for discrimination are also described.

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Date submitted: 12 Sep 2013

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