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A rapid non-destructive inspection method applied to EAST lower divertor by IR thermography technique

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Graphite is used as plasma facing material in EAST lower divertor consisting of hundreds of graphite tiles which are connected to heat sink using screw bolt currently. A soft graphite sheet is inserted between graphite tile and heat sink to improve the ability of thermal conductivity. To evaluate the quality of the thermal contact between graphite tile and heat sink , efficient non-destructive inspection is essential before assmbling divertor to EAST device. This paper introduce a rapid non-destructive inspection method for EAST lower divertor by infrared(IR) thermography which records the surface temperature of each graphite tile . The poor quality of thermal contact can be examined by comparison of the transient thermal response of surface of graphite tiles in symmetric region of the same divertor module at a rapid switch from hot to cold water flowing in the tube welded to heat sink. Three-dimensional (3D) thermal finite element (FE) analyses have been performed to simulate the excellent quality of thermal contact and as a reference for the experimental observations obtained by IR thermography .

Eligible for student paper award?

No

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