

HTPD 2018



Contribution ID : 393

Type : not specified

6.14 System Level Design of the ITER Bolometer Port Plug Cameras

Tuesday, 17 April 2018 10:31 (120)

The ITER bolometer diagnostic is planned to have 550 lines of sight (LOS) distributed all over the vessel. 240 channels are provided by cameras mounted in two Upper Ports and in one Equatorial Port. This paper describes the current status of the system level design of the port cameras and the solutions proposed how to implement all required camera components while meeting a multitude of competing requirements. Sensor holders, support structures and different apertures depending on the camera type (pinhole or collimator), cable connectors, ceramic track plates and many mineral insulated cables have to be integrated within a restricted space envelope to guarantee functionality. The impact of the interface requirements agreed with the port integrator, such as the mechanical mounting interface, the electrical interface and the load specifications, on the design flexibility will be discussed. Using the example of an Upper Port camera with 60 LOS, the assembly of the camera components is explained and two currently discussed architecture options of the RH-maintenance scheme in the hot cell are compared. Finally, considerations on a cost-effective design of the track plates and design optimizations based on thermal finite element analysis of the camera are presented.

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Session Classification : Session #6, Tuesday Morning Poster Session