Contribution ID : **329** Type : **not specified**

8.29 Plasma facing component calorimetry for measurement of shot integrated deposited energy in NSTX-U

Tuesday, 17 April 2018 16:01 (120)

The upgrade to the National Spherical Torus eXperiment (NSTX-U) doubles the neutral beam power and enables plasmas to be sustained for up to 5 seconds. The graphite plasma facing components (PFCs) have been re-designed to handle greater heat and energy fluxes than were seen in NSTX using a castellated design. Some scenarios will produce divertor heat fluxes well above the 6-7 MW/m2 the PFCs are designed to withstand, and means of intra and inter-shot control are under investigation Select castellations in divertor regions will be instrumented with thermocouples designed to measure the shot-integrated energy deposited in each castellation. The thermocouples are located away ˜25mm from the plasma facing surface to prevent stress concentrations in the castellations. The deposited energy is therefore determined by finite element analysis of the thermal behavior of the tile consistent with the thermal wave propagation in the castellations. We present experimental testing and validation of a castellated graphite target instrumented with thermocouples at various depths in the castellation. During testing, incident heat flux is provided by a programmed, electron beam system and surface temperatures are measured via infrared thermography directly viewing the target surface.

Primary author(s) : GRAY, Travis (ORNL)

Presenter(s) : GRAY, Travis (ORNL)

Session Classification : Session #8, Tuesday Afternoon Poster Session