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P4.068 Thermography of the FTU toroidal limiter during disruptions

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The study of the temporal and spatial characteristics of the disruption heat load on the plasma facing components (PFCs) of a limiter tokamak can be relevant also for divertor machines, where the plasma configuration often degrades to L-mode before the thermal quench.

FTU is an all metal limiter tokamak with AISI 304 stainless steel wall and an inboard full TBM toroidal limiter. FTU being a cryogenic tokamak, the in vessel PFCs are usually at very low temperature, making the detection of their surface temperature during the discharge very difficult. Only during disruptions the thermography of the toroidal limiter, where the plasma usually leans on at the onset of the thermal quench and the plasma is pushed during the current quench, can provide surface temperature and heat loads.

In this paper the analysis of the thermographic images of one out of the 12 toroidal limiter sectors (about 35 x 35 cm²) will be reported. These images have been transferred by an array of Germanium lenses, through a long and narrow (width at the entrance of the vacuum vessel about 8 cm) equatorial port, to a fast thermocamera located at the distance of about 2 meters from the limiter. The preliminary quantitative analysis of the heat loads during different types of disruptions as well as their comparison with those inferred by PFCFLUX code modeling will be presented.

The frequent and sometimes massive presence of eroded or mobilized dust detected by the thermocamera during disruptions will be discussed as well.

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