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Fine structure of heat flux deposition for different ELM types in NSTX JOON-WOOK AHN, RAJESH MAINGI, Oak Ridge National Laboratory, LANE ROQUEMORE, HENRY KUGEL, Princeton Plasma Physics Laboratory, VLAD SOUKHANOVSKII, Lawrence Livermore National Laboratory — Investigation of heat flux deposition onto the divertor plates for different ELM types has been carried out in NSTX using a high temporal resolution IR camera, and revealed distinctive features for each ELM type. A single Type-III ELM is found to carry up to ∼5% of total plasma energy to the divertor, during which typical peak heat flux (q_{peak}) values are 30-60 MW/m^2 with near SOL e-folding length (λ_q) of 3-4cm. Peak heat flux during the inter-ELM period is typically 3-5MW/m^2 with λ_q=1-1.5cm. On the other hand, the small, Type-V ELMs exhibit very different heat deposition characteristics. Due to the presence of multiple ELM filaments for a single time slice, q_{peak} becomes significantly lower and λ_q larger, q_{peak}=1-2MW/m^2 and λ_q=2-3cm. Filaments also make the far SOL λ_q very long, λ_q ≥10cm. As a result, Type-V ELMs are found to effectively disperse heat flux onto a large area of divertor plates with significantly lower q_{peak}. A detailed data analysis for heat flux deposition for different ELM types will be presented and implications for the future machine will be discussed. This work was supported by the US Department of Energy, contract numbers DE-AC05-00OR22725, DE-AC02-09CH11466, and DE-AC52-07NA27344.

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