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Toroidal asymmetry of divertor heat deposition in NSTX[1] JOON-WOOK AHN, ORNL, KAIFU GAN, ASIPP, RAJESH MAINGI, JOHN CANIK, TRAVIS GRAY, JEREMY LORE, ORNL, FILIPPO SCOTTI, LANE ROQUE-MORE, PPPL, ADAM MCLEAN, VLAD SOUKHANOVSKII, LLNL — 2-D heat flux data calculated by a 3-D heat conduction solver allowed for the evaluation of peak heat flux (q_{peak}) and heat flux width (λ_q) for each toroidal angle, which generates a toroidal array of q_{peak} and λ_q at each time slice. Then the toroidal degree of asymmetry (DoA) of q_{peak} and λ_q as a function of time was defined as $\mathrm{DoA}(q_{peak}) = \sigma_{qpeak}/\mathrm{mean}(q_{peak})$ and $\mathrm{DoA}(\lambda_q) = \sigma_{\lambda q}\ /\mathrm{mean}(\lambda_q)$, where σ is the standard deviation of q_{peak} and λ_q over data in the toroidal array. In case of ELMs and 3-D field application, the helical heat deposition produces additional scatter of data around mean values to the background scatter level without these events and it raises DoA for both q_{peak} and λ_q. Both values of $\mathrm{DoA}(q_{peak})$ and $\mathrm{DoA}(\lambda_q)$ are highest at the ELM peak times, with $\mathrm{DoA}(q_{peak})$ up to $\sim$0.9 and $\mathrm{DoA}(\lambda_q)$ up to $\sim$0.3 for typical type-III ELMs, while they become lower toward the later stage of the inter-ELM period, *eg*, $\mathrm{DoA}(q_{peak})$ $\sim$0.15 and $\mathrm{DoA}(\lambda_q)$ $\sim$0.05. The correlation between $\mathrm{DoA}(q_{peak})$ and $\mathrm{DoA}(\lambda_q)$ is the strongest at the ELM peak times and becomes weaker later in the ELM cycle.

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