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Dependence of the Heat Flux Width on the Connection Length in DIII-D,* M.A. Makowski, C.J. Lasnier, V.A. Soukhanovskii, *LLNL*; A.W. Leonard, T.H. Osborne, T.W. Petrie, P.B. Snyder, *General Atomics* – The heat flux width characterizes the scale length of peak power deposition in the divertor. The total heat flux width, $\lambda_{int} \approx \lambda_q + 1.74S$, has contributions from the scrape-off layer itself, characterized by the quantity λ_q, and from the private flux region, characterized by a Gaussian-like width, *S*. Most work to date has focused on the physics of λ_q, with the essential finding that it depends approximately inversely on the plasma current. Here, the emphasis is on the *S* parameter and, in particular, its dependence on the connection length, L_{conn}. Data from high X-point discharges (L_{conn}~30 m) have been used to extend the DIII-D heat flux width database beyond discharges with a standard divertor configuration (L_{conn}~20 m). Snowflake divertor discharges (L_{conn}>40 m) will also be analyzed to further extend the range of L_{conn}. Preliminary results indicate that *S* increases with L_{conn}, consistent with *S* being determined by a diffusive process. This result has important implications for advanced divertor designs as it demonstrates that long connection lengths increase the heat flux width.

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