

Abstract Submitted
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Development of Surface Eroding Thermocouples in DIII-D JUN REN, DAVID DONOVAN, UTK, JON WATKINS, SNL, HUIQIAN WANG, ORAU, DMITRY RUDAKOV, UCSD, CHRISTOPHER MURPHY, GA, EZEKIAL UNTERBERG, ORNL, DAN THOMAS, REJEAN BOIVIN, GA — The Surface Eroding Thermocouple (SETC) is a specialized diagnostic for characterizing the surface temperature evolution with a high temporal resolution (~ 1 ms) which is especially useful in areas unobservable by line-of-sight diagnostics (e.g. IR cameras). Recently, SETCs were tested in DiMES and successfully acquired temperature signals during strike point sweeps on the lower divertor shelf. We observed that the SETCs have a sub-10 ms time response and is sufficient to resolve ELM heat pulses. Preliminary analysis shows heat fluxes measured by SETCs and IR camera agree within 20%. Comparison of SETCs, calorimeters and Langmuir probe also show good agreement. We plan to implement an array of SETCs embedded in the tiles forming the new DIII-D small angle slot (SAS) divertor. Strategies to improve the SNR of these SETCs through testing in DiMES before the final installation will be discussed. This work was supported by the US Department of Energy under DE-SC0016318 (UTK), DE-AC05-00OR22725 (ORNL), DE-FG02-07ER54917 (UCSD), DE-FC02-04ER54698 (GA), DE-AC04-94AL85000 (SNL).

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