Performance of the Launchers in the DIII-D ECH System* K. Kajiwara, *Oak Ridge Institute for Science Education*, C.B. Baxi, J. Lohr, Y.A. Gorelov, M. Green, D. Ponce, and R.W.Callis, *General Atomics*

The ECH launchers in the DIII-D tokamak have poloidal and toroidal scan capability. They are equipped with thermal and video monitors and the launcher assemblies are protected against arcs by interlocks based on Langmuir probes. The thermal performance of three different ECH launcher mirrors with different designs, all of which have passive radiative cooling, has been evaluated theoretically and experimentally. The mirrors are designed to withstand the thermal loading from an 800 kW rf beam of 5 s duration (and, for one design, 10 s) at 1% duty cycle. The peak temperatures increase linearly with pulse length. However, the peak temperatures are lower than the values predicted using electromagnetic theory and 3-D thermal analysis (using the finite element code COSMOS). A measurement of the thermal contact resistance for the sensors on the mirrors was made, which showed the resistance to be 2×10^{-4} m^2°C/W. This resistance can produce the observed 50% difference between the experimental data and a thermal analysis made assuming perfect thermal contact. The launcher performance, diagnostics and thermal measurements will be described.

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