Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

50 kV Klystron Driver for Fusion Science Applications[1] JAMES PRAGER, ALEX HENSON, KENNETH E. MILLER, TIMOTHY ZIEMBA, STEVEN WILSON, Eagle Harbor Technologies, Inc. — Eagle Harbor Technologies, Inc. (EHT) is developing a new, solid-state klystron driver for use in fusion science applications. EHT is using high-frequency SiC MOSFET-based full bridges, previously developed with support of the DOE SBIR program. These full bridges drive a resonant circuit that allows for zero current switching, reducing the stress on the solid-state switches. The high frequency operation allows a more compact system, which can be placed closer to the klystrons. The Phase I program focused on a demonstration of 50 kV operation with low output voltage ripple (<1%) and minimizing stored energy in the output filter (<2 J). During a klystron fault, this energy is deposited into the klystron. Minimizing the stored energy is a more robust, passive solution that allows for the removal of additional switching components to protect the klystron. EHT will present the Phase I results. In a potential Phase II program, EHT will build and deliver a 50 kV, 600 kW klystron driver to MIT for testing.

[1]This work has been supported by a DOE SBIR (DE-SC0018687).

James Prager
Eagle Harbor Technologies

Date submitted: 03 Jul 2019 Electronic form version 1.4