

Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Heat and particle fluxes of KAERI divertor plasma simulator based on high power AF-MPD thruster¹ KIL-BYOUNG CHAI, DUCK-HEE KWON, Korea Atomic Energy Research Institute — A divertor plasma simulator which can provide high heat and particle fluxes to a target has been constructed at Korea Atomic Energy Research Institute (KAERI) using Applied-Field MagnetoPlasmaDynamic (AF-MPD) thruster concept. An AF-MPD thruster, a kind of electric propulsion, is typically powered by several hundred of kilowatts DC power supply and can generate very high density plasmas at the low pressure similar to fusion divertor region. Our facility will be used to study and develop divertor materials and heat sink designs that can handle heat flux of 10 MW/m^2 and particle flux of $10^{24} \text{ /m}^2\text{/s}$. At present, we have successfully developed our plasma source and the heat flux provided by our divertor simulator is measured to be 2.5 MW/m^2 by a single channel calorimeter consisting of copper block and several thermocouples. The measured particle flux is in the order of $10^{23} \text{ /m}^2\text{/s}$ by optical emission spectroscopy with collisional-radiative model and a Langmuir probe.

¹This work was supported by National RD Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Science and ICT (NRF-2017M1A7A1A03072768).

Kil-Byoung Chai
KAERI

Date submitted: 07 Jul 2019

Electronic form version 1.4