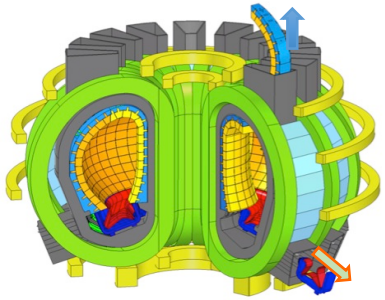
Physics and Engineering Design Studies on Power Exhaust and Divertor for a 1.5 GW Fusion Power DEMO

N. Asakura, et al.

FIP/P7-22

Joint Special Design Team for Fusion DEMO

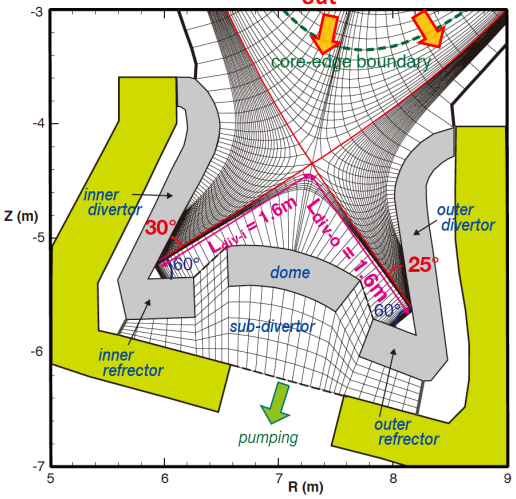
JA DEMO 2014

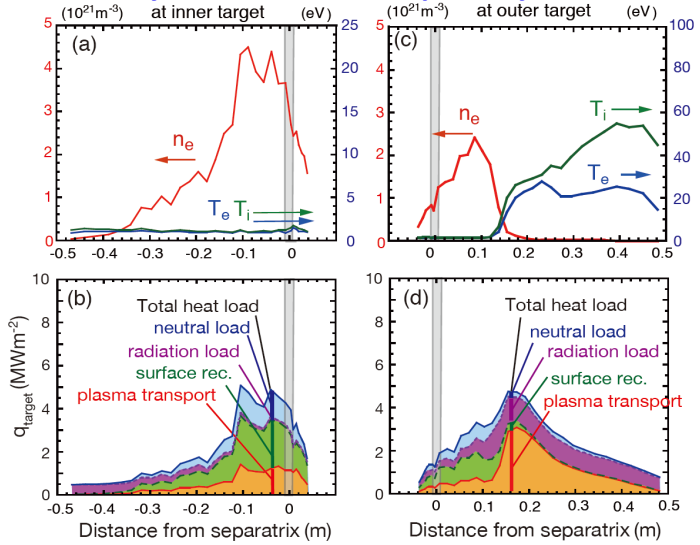


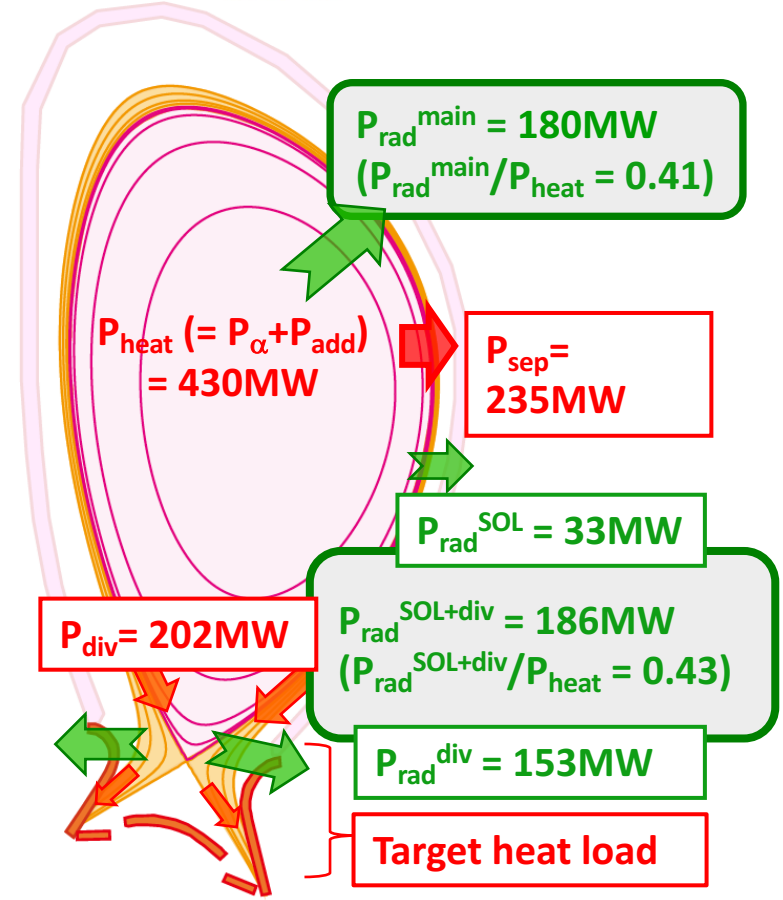
Power handling with imp. seeding has been studied in steady-state DEMO (Japan):
P_α=300MW, P_{add}~80MW, R_p=8.5m, **P_{sep}= 220-280MW, P_{sep}/R= 26-33MW/m (1.5-2xITER).**

- **Long leg divertor of 1.6 m (1.5xITER) was investigated, using SONIC code with Ar seeding:**

Total radiation of P_{rad}/P_{heat}=0.84 provides that the peak heat load is reduced to ~5 MW/m^2 level

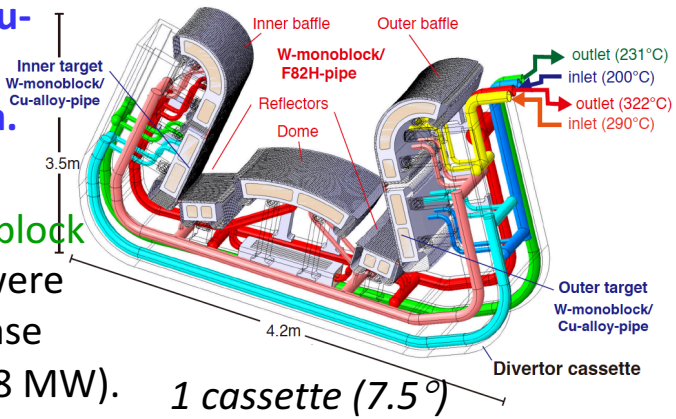






- **Neutronics analysis showed W/Cu-alloy heat sink can be applied at high heat flux and low n-flux area.**

Heat removal concept of W-monoblock and Cu-alloy/F82H cooling-pipes were designed for severe assumption case ($P_{div}^{thermal}$: 300MW + $P_{div}^{neutron}$: 128 MW).



1 cassette (7.5°)