

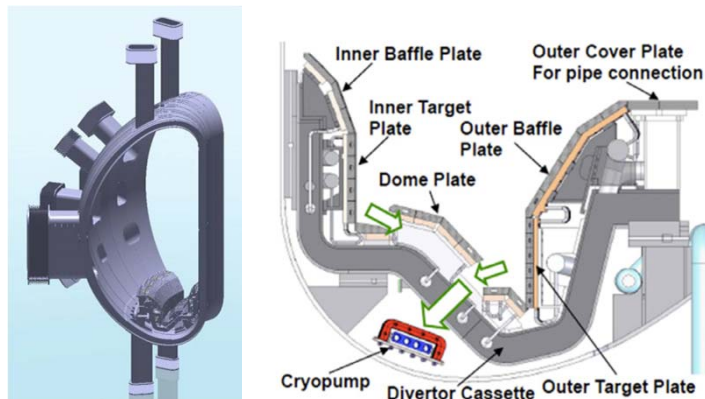
Assessment of the operational window for JT-60SA divertor pumping under consideration of the effects from neutral-neutral collisions, *Chr. Day et al.*



Investigated JT-60SA scenario #2

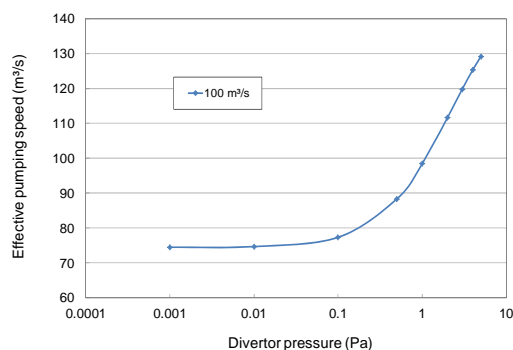
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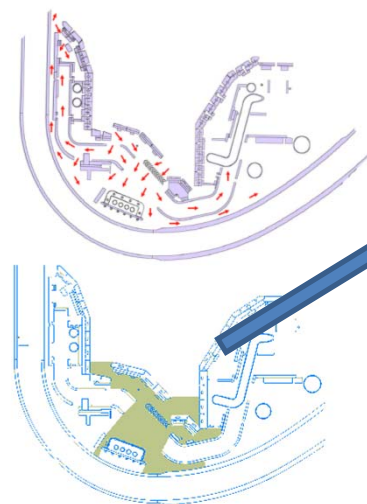


Background: JT-60SA will start operation in 2019. One of the top research goals is to study high density plasma physics in view of DEMO. This paper outlines a stepwise procedure for the performance analysis of a pumped divertor. In the case of JT-60SA, it combines physics (by using SONIC calculations for the given plasma scenario a boundary condition) and technology (by using collisional flow analysis of the neutrals in the sub-divertor) aspects to derive an integrated design. It is found that for scenario # 2 the existing pumping system is expected to perform well, even under adverse conditions.

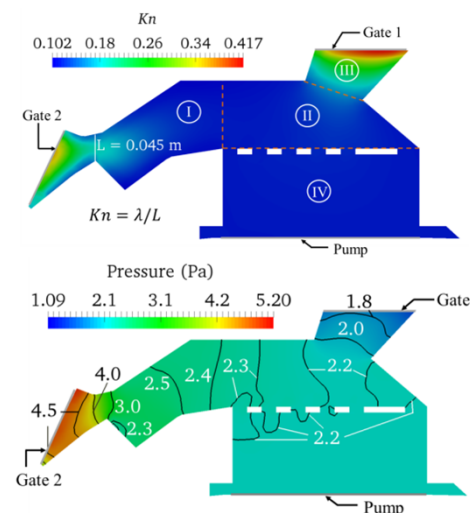
Step 1 – Flow pattern analysis with ITERVAC



The nominal pumping speed of 100 m³/s reduces to 70 m³/s in the free molecular regime, and re-establishes for divertor pressures above 1 Pa.



Step 2 – Collisional neutral flow analysis with DIVGAS



The Kn number plot demonstrates the necessity to consider collisions (Found Kn numbers below 10), even for this scenario with only a moderate normalized density of $n_e/n_{GW}=0.5$.

The found pressures at the inlet of the pump are above 1 Pa, which ensures that the full nominal pumping speed is available.

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