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SOLPS Modeling of Slot Divertor Configuration on DIII-D[1] C.F. SANG, GA, P.C. STANGEBY, U. Toronto, H.Y. GUO, L.L. LAO, GA — A major thrust of the DIII-D boundary/PMI initiative is to develop an advanced divertor configuration for next-step devices, such as FNSF and DEMO. We are adopting an integrated approach by optimizing both divertor structure and magnetic shape. Initial SOLPS modeling was carried out to optimize divertor structure shape to enhance divertor power dissipation, focusing on slot configurations. In particular, four different slot divertor structures, i.e., orthogonal-target slot, slanted-target slot, very narrow slot and v-shaped slot have been analyzed and comparisons made with an open divertor structure. It is found that the slot helps to trap recycling neutrals and impurities thus increasing radiative power dissipation in the divertor, reducing the electron temperature T_e and the perpendicular heat flux $q_\perp$ at the target plate. As expected, a narrower slot leads to lower T_e and $q_\perp$ than a less narrow one. The v-shaped slot appears to be especially effective at redirecting and concentrating recycling neutrals and impurities near the separatrix, thus promoting detachment at a lower upstream density than the other configurations.

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