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The role of pumping on particle removal and divertor plasma conditions[1] CHAOFENG SANG, Dalian University of Technology, PETER C. STANGEBY, University of Toronto, HOUYANG GUO, VINCENT CHAN, General Atomics, LIANG WANG, GUOSHENG XU, Institute of Plasma Physics, Chinese Academy of Sciences, DALIAN UNIVERSITY OF TECHNOLOGY TEAM, BP-MIC GENERAL ATOMICS COLLABORATION, EAST COLLABORATION — The effect of pumping location in a closed detached divertor configuration is examined with SOLPS modeling. A closed divertor can increase neutral pressure and enhance radiative dissipation, thus it is proposed for advanced tokamak operation in order to achieve detachment at as low an upstream plasma density as possible. However, the necessity to pump the closed divertor results in reduction of the high density of neutrals. By changing the recycling rate at the pump, it is confirmed that the pump location has a great impact on the effective pumping speed, which influences the divertor plasma significantly. Higher pumping speed reduces the neutral density and increases Te as well as the heat flux to the target. For a given particle removal rate, however, the plasma conditions are insensitive to the pump location within the divertor. High D2 gas puffing with high pumping could help to achieve detachment only when the upstream density is increased by puffing, in contrast, a deeper detachment can be easily reached in a low pumping and low puffing case.

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