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2D Simulations of KSTAR edge plasma using SOLPS 4.3 code SEUNG BO SHIM, Pusan National University, VLADISLAV KOTOV, DETELEV REITER, Forschungszentrum Jülich GmbH, HYUNSUN HAN, JIN YONG KIM, National Fusion Research Institute, YONG-SU NA, Seoul National University, HAE JUNE LEE, Pusan National University — Control of plasma density and impurity content is crucial to achieve high performance long pulse operation in tokamaks. In this paper edge plasma scenarios of KSTAR are analyzed numerically. ITER version of the well-known SOLPS code package (SOLPS4.3) which comprises 2D multi-species fluid plasma code B2 and 3D Monte-Carlo particle solver EIRENE coupled self-consistently. This latter allows full kinetic neutral particle transport modeling in realistic geometries including pump ducts and leaks to the main vessel from the sub-divertor volumes. Both connected and disconnected double null configurations are investigated. The main focus is made on studying the sensitivity of the edge plasma parameters with respect to gas puffing rate (density scans), thus, effectiveness of this latter for the plasma control. Preliminary findings show that for the reference KSTAR pumps: total pumping speed 100 m^3/s, pumping rates up to 13 $Pa{\cdot}m^3/s$, and high performance discharges with heating power $\approx$ 8 MW plasma in both divertors is likely to stay attached. At the same time, plasma temperature at the divertor targets as well as the peak incident heat flux density can be effectively reduced with increased gas puff, been especially sensitive in the inner divertors.

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