

Abstract Submitted  
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**Neutral leakage in open versus closed divertors**<sup>1</sup> LIVIA CASALI, DAVID ELDON, General Atomics - San Diego, JOSE BOEDO, UCSD, ANTHONY LEONARD, BRENT COVELE, General Atomics - San Diego — A metric for divertor closure in terms of the percentage of neutrals escaping the divertor is presented. The effect of divertor closure on neutral leakage is investigated using the SOLPS code in attached and detached divertor conditions for DIII-D open and closed divertors. At the detachment onset the population of neutrals escaping the divertor is 12% for the closed and 35% for the open divertor. The energy transport in the two geometries is analyzed in depth and it is demonstrated that detachment at lower upstream density found for the closed divertor is due to the following physics mechanisms: the reduction of the convective flow, the increase of the pressure loss and the increase of the power loss. The increase of power loss with closure is due more to hydrogenic emission than the inherent carbon impurity radiation [1]. The results of this work emphasizes that the effect of divertor closure to detachment is not just the divertor neutral trapping but also a shift in the parallel pressure balance between upstream and downstream [2]. 1] L. Casali et al. Contrib.Plasma Phys.58(7-8), 725-731 (2018), 2] L. Casali et al. Nucl. Fusion60 076011 (2020).

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