

private space. Obviously, there is a need for a 3D modeling code, to obtain a more quantitative description of the trends obtained by the 2D model.

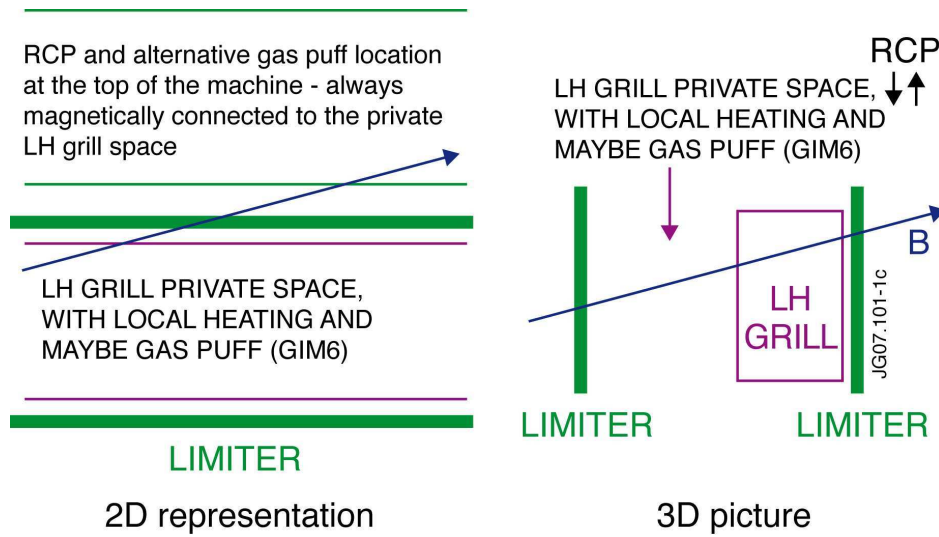


Fig. 1. Schematic representation of the 2D and 3D configuration of the LH grill and RCP.

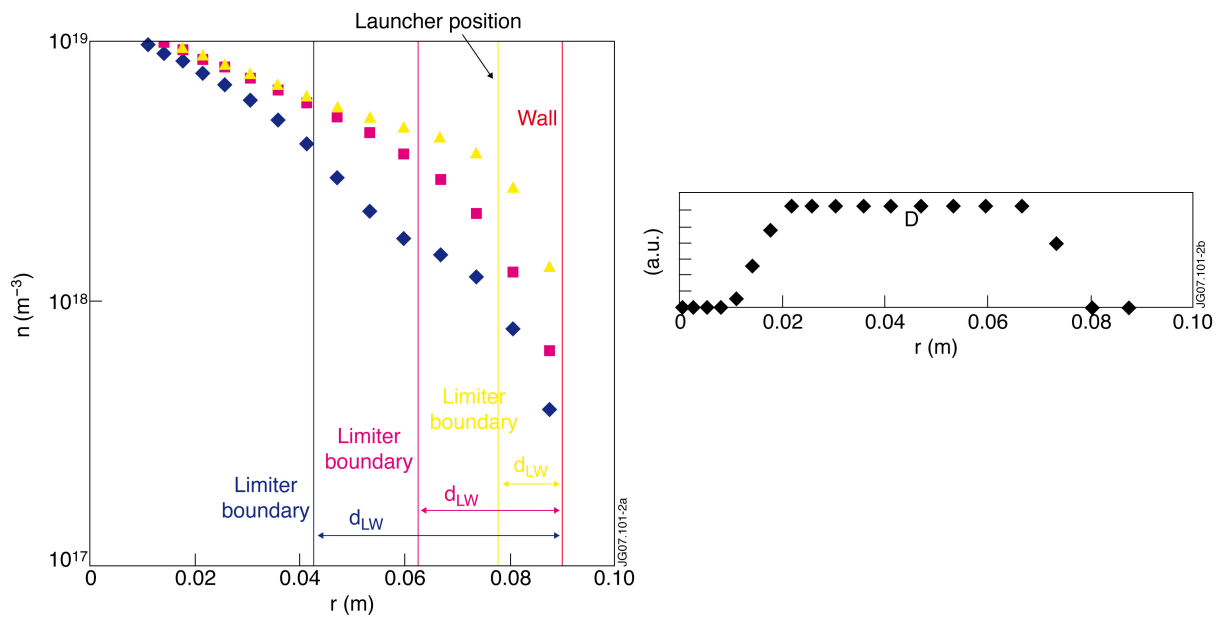


Fig. 2. Left figure: Effects of the limiter boundary location. x - axis: distance from separatrix in m . Right figure: Profile “D” of the LH field dissipation [a.u.]. Series 1 (blue diamonds): $d_{LW} = 4.75$ cm (grill ~ 3 cm behind the limiter), series 2 (magenta rectangles): $d_{LW} = 2.75$ cm (grill ~ 1 cm behind the limiter), and series 3 (yellow triangles): $d_{LW} = 1.25$ cm (grill is \sim flush with the limiter).

Figure 2 then shows $n_{e,SOL}$ in LH private SOL as a function of the limiter boundary location (changing the distance limiter – wall d_{LW} is similar to changing the distance launcher-limiter) Gas puff is $1e22$ el/s near the outer mid-plane (OMP), i.e., by “GIM6”. Heating in front of the

grill is 150 kW. The assumed profile of the LH SOL dissipation used in this contribution is shown as profile “D” on the bottom figure. The upper figure shows the $n_{e,SOL}$ in the OMP (between limiters acting as a sink) in the launcher private SOL. The next Figure 3 shows $n_{e,SOL}$ in the limiter sink (top figure) and at the RCP location (bottom figure) as a function of the limiter boundary location. Gas puffing and heating is the same as in Fig.2.

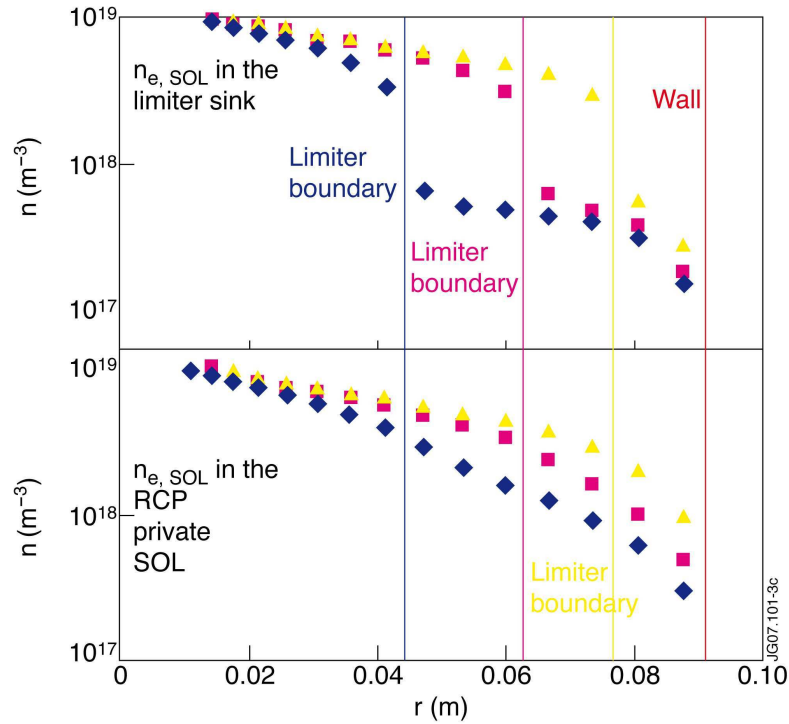


Fig. 3. Profiles of $n_{e,SOL}$ near limiters and in the RCP private SOL.

Figure 4 shows $n_{e,SOL}$ in the OMP (upper figure) as a function of the heating and puff rates, with $d_{LW} = 4.75$ cm; on the bottom figure there are neutrals profiles in the OMP. Let us note that joined heating and gas puffing tend to flatten the $n_{e,SOL}$ profile, cf. the cyan curve. It can be demonstrated that the flatness of the $n_{e,SOL}$ profile depends also on the assumed profile of the LH wave dissipation. The nearer to the grill the LH power is dissipated, the flatter the $n_{e,SOL}$ profile is. Figure 5 shows $n_{e,SOL}$ in the OMP in grill private SOL, as a function of the gas puffing location, $d_{LW} = 1.25$ cm, with heating in front of the grill = 150 kW.

Main results: Both gas puffing and heating/ionization are important in raising the density in the far SOL. Although OMP seems to be the best location for gas puffing, the other two gas puffing locations (near RCP, at the top) also give an increase in $n_{e,SOL}$ with heating. This is important for ITER, where top gas puffing is currently planned. The modeling shows the flattening of the far $n_{e,SOL}$ profile, which is observed in experiments [1].

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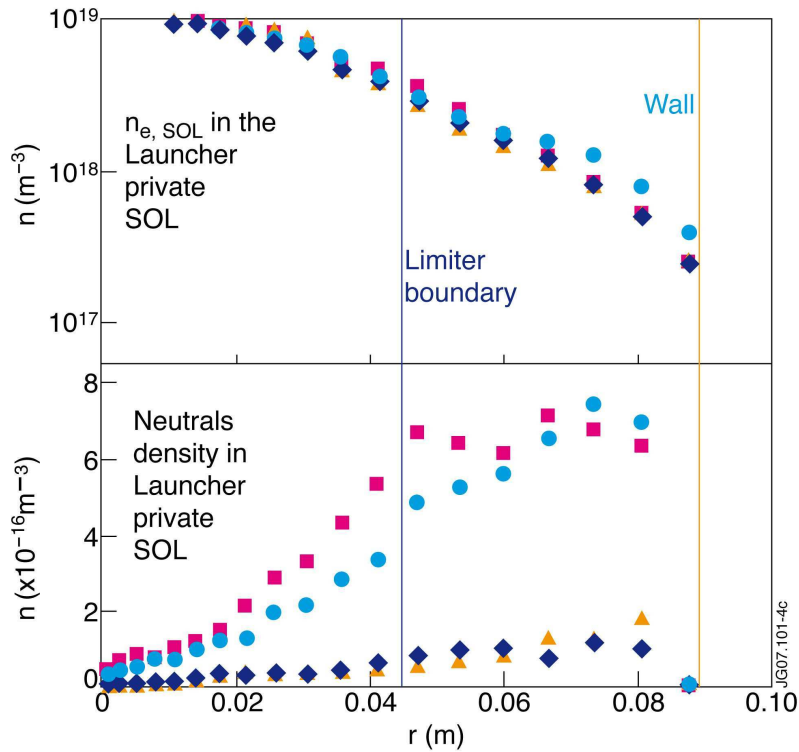


Fig. 4. Upper figure: $n_{e,SOL}$ as a function of the heating and puff rates, at the bottom figure there are corresponding neutrals profiles in the OMP. Blue diamonds: 0 heating, 0 puff, magenta rectangulars: 0 heating, puff = $1e22$ el/s, yellow triangles: heating = 150 kW, 0 puff, Cyan circles: heating = 150 kW, puff = $1e22$ el/s.

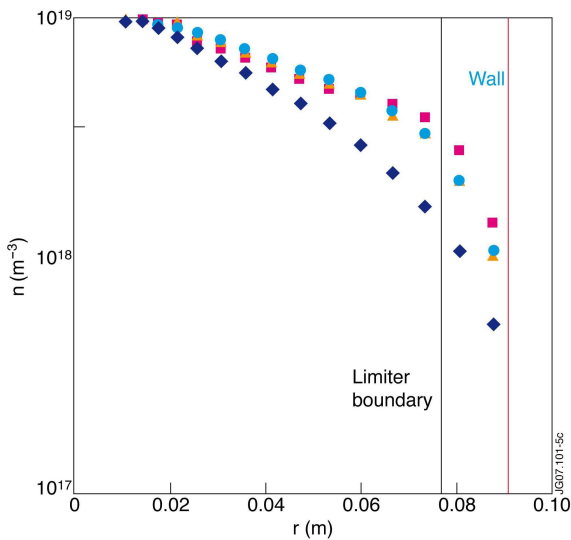


Fig. 5. Profile of $n_{e,SOL}$ in the OMP in grill private SOL, as a function of the gas puff location. Blue diamonds: 0 heating, 0 puff, magenta rectangulars: gas puff $1e22$ el/s near OMP, yellow triangles: gas puff near RCP, cyan circles: gas puff at the top.

[1] M. Goniche *et al.*, this Conference; K. Rantamäki *et al.*, 17th USA RF Conference 2007.

[2] V. Petržilka *et al.*, submitted into Nuclear Fusion.