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CORRIGENDUM

Erratum on surface loads and edge fast ion distribution for co- and counter-injection in ASDEX Upgrade

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(Some figures in this article are in colour only in the electronic version)

Due to a programming error, in the NBI simulations the test particle collisions were evaluated against only one background ion species. To make things worse, this one species was the 4% carbon impurity. All the NBI simulations reported in the original paper (Hynönen *et al* 2007 *Plasma Phys. Control. Fusion* **49** 151–74) [1] have now been rerun including the background deuterium, and it has been found that the original conclusions remain intact. The tritium simulations were not affected by this error.

However, while the qualitative results remain the same, there are quantitative differences in the overall levels which are best summarized in the corrected tables 1, 2 and 3. The quantitative changes are reflected in the corresponding figures 4 and 6–16 in the original paper [1], but there are no significant changes in their shapes. In all cases except counter-injection without ripple, the increased collisions reduce the wall and the divertor loads. This is to be expected, because the majority of the wall load in counter-injection cases is due to direct ion orbit losses, which happen on a time scale too short to be affected by the collisions. We also point out that the numbers quoted in the conclusions for peak divertor and wall loads do not change.

Table 1. The breakdown of the particle fluence between the wall and the divertor. Percentages of the NBI source rate $\Gamma_{\rm NBI} = 7.3 \times 10^{20}\ {\rm s}^{-1}$ shown in parentheses.

	Fluence/10^{19} s^{-1} (co-inj.)		Fluence/10^{19} s^{-1} (counter-inj.)	
Simulation	Wall	Divertor	Wall	Divertor
No ripple, no E_r	0.02 (0.02%)	3.1 (4.3%)	6.9 (9.4%)	9.3 (13%)
Only E_r	0.06 (0.08%)	4.1 (5.7%)	7.2 (9.8%)	10 (14%)
Only ripple	3.4 (4.7%)	3.0 (4.1%)	12 (17%)	6.7 (9.2%)
Both ripple and E_r	4.2 (5.8%)	2.9 (3.9%)	15 (20%)	5.4 (7.4%)

Table 2. The breakdown of the incident power between the wall and the divertor. Percentages of the total NBI power 4.8 MW shown in parentheses.

	Power/kW (co-inj.)		Power/kW (counter-inj.)	
Simulation	Wall	Divertor	Wall	Divertor
No ripple, no E_r	0.52 (0.01%)	110 (2.3%)	490 (10%)	320 (6.6%)
Only E_r	1.6 (0.03%)	120 (2.5%)	460 (9.6%)	270 (5.5%)
Only ripple	150 (3.1%)	110 (2.3%)	740 (15%)	250 (5.3%)
Both ripple and E_r	200 (4.1%)	110 (2.2%)	850 (18%)	180 (3.7%)

Table 3. The average energy E_{ave} of particles hitting the divertor and the wall in co- and counter-injection simulations.

	E_{ave}/keV (co-inj.)		E_{ave}/keV (counter-inj.)	
Simulation	Wall	Divertor	Wall	Divertor
No ripple, no E_r	19[a]	22	44	21
Only E_r	16[a]	18	40	17
Only ripple	27	23	38	24
Both ripple and E_r	29	23	36	21

[a] Unreliable due to low statistics.

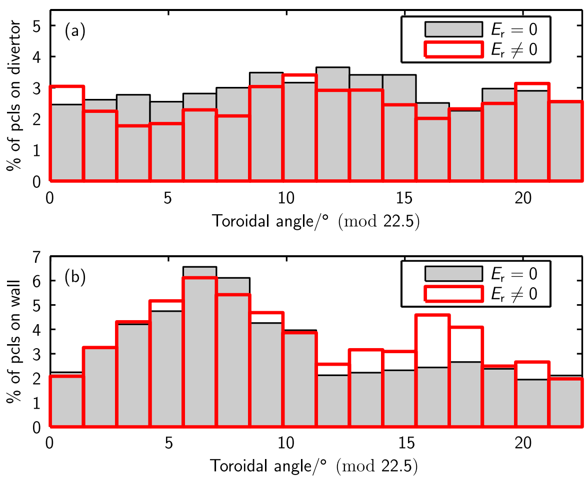

Figure 1. The toroidal distribution of the particle flux (*a*) onto the divertor and (*b*) onto the wall structures as percentages of the total number of lost particles with (red/grey thick-lined bars) and without E_r (grey bars) in the case with finite toroidal ripple for co-injected neutral beams (H-mode). The TF coils are located at $\phi = 0^\circ \pmod{22.5^\circ}$.

The changes brought on to the fast ion distribution are much more interesing. In the original paper [1], the effect of the radial electric field was found nearly negligible. In the absence of a radial electric field the effect of corrected collisions is to scale the distributions down by a constant factor of about 2. Including the radial electric field characteristic of H-mode operation is now found to almost compensate the effect of the ripple. These changes and the resulting discussion merit a separate letter where the new figures will be presented.

In addition, figures 10, 15 and 23 in the original paper [1] had technical problems and are replaced by figures 1, 2 and 3 presented here. The original figure 10 did not show the toroidal

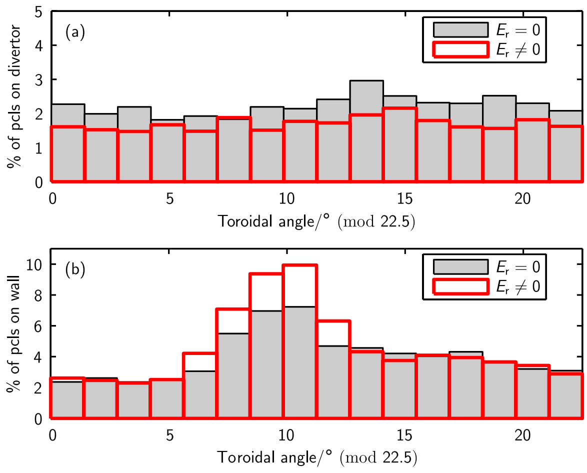

Figure 2. The toroidal distribution of the particle flux (*a*) onto the divertor and (*b*) onto the wall structures as percentages of the total number of lost particles with (red/grey thick-lined bars) and without E_r (grey bars) in the case with finite toroidal ripple for counter-injected neutral beams (QH-mode). The TF coils are located at $\phi = 0° \pmod{22.5°}$.

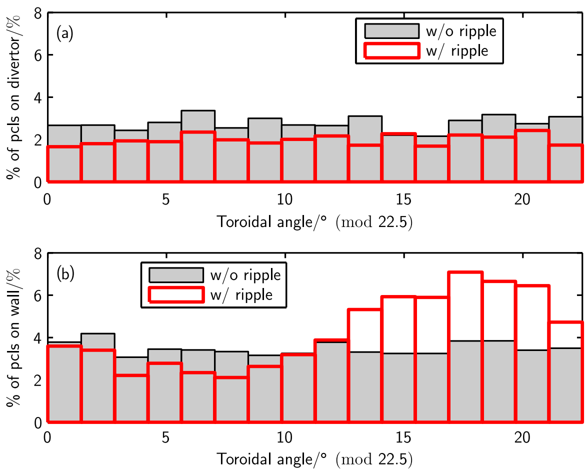

Figure 3. The toroidal distribution of the triton flux (*a*) onto the divertor and (*b*) onto the wall structures in the axisymmetrical case (grey bars) and in the case with finite toroidal ripple (red/grey thick-lined bars).

distribution as given in the figure caption, but displayed a duplicate of figure 8. The original figure 15 displayed the toroidal distribution for the co-injection case, not the counter-injection case as claimed by the figure caption. The new figures 1 and 2, corresponding to figures 10 and 15 in the original paper [1], are from the new simulations. The legend in the original figure 23 was incorrect.

References

[1] Hynönen V *et al* 2007 *Plasma Phys. Control. Fusion* **49** 151–74