ERRATA

Erratum: "Neoclassical conductivity and bootstrap current formulas for general axisymmetric equilibria and arbitrary collisionality regime" [Phys. Plasmas 6, 2834 (1999)]

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(Received 3 September 2002; accepted 3 September 2002)

[DOI: 10.1063/1.1517052]

The authors apologize for this late correction of a few errors which appeared in our paper. The main one is the sign of the coefficient 0.315 in Eq. (17b) on p. 2838, which should be positive, and therefore replaced by

$$\alpha(\nu_{i*})=\left[\frac{\alpha_0+0.25(1-f_t^2)\sqrt{\nu_{i*}}}{1+0.5\sqrt{\nu_{i*}}}+0.315\nu_{i*}^2 f_t^6\right]\times\frac{1}{1+0.15\nu_{i*}^2 f_t^6}.$$

This was defined such as to obtain the correct limit at large collisionality, 0.315/0.15=2.1, as shown in Fig. 7 on p. 2838. Also in these formulas Z usually refers to the effective charge Z_{eff}, except for the ion terms Eqs. (18c) and (18e), where it should be replaced by the main ion charge Z_i.

In the last but one equation, a term is missing, as seen from the definition of A_4 in Eq. (6) on p. 2835, and it should read

$$\langle j_\parallel B\rangle=\sigma_{\text{neo}}\langle E_\parallel B\rangle-I(\psi)p_e\times\left[\mathcal{L}_{31}\frac{p}{p_e}\frac{\partial\ln p}{\partial\psi}+\mathcal{L}_{32}\frac{\partial\ln T_e}{\partial\psi}+\mathcal{L}_{34}\alpha\frac{1-R_{pe}}{R_{pe}}\frac{\partial\ln T_i}{\partial\psi}\right].$$

Note that the term was correctly included in the last equation on p. 2839, but the typical values for the different terms are $\mathcal{L}_{31}\approx\mathcal{L}_{34}\approx+0.5$, $\mathcal{L}_{32}\approx-0.2$, $\alpha\approx-0.5$, and $R_{pe}\approx 0.5$.

Another useful way to define the bootstrap current with only a few parameters, for magnetohydrodynamic studies, for example, is to use $R_{pe}=p_e/p$ and $\eta=\partial\ln T/\partial\ln n$ and to assume similar scalelengths for the different species. In this way the last equation on p. 2839 simplifies to

$$\langle j_\parallel B\rangle=\sigma_{\text{neo}}\langle E_\parallel B\rangle-I(\psi)\frac{\partial p}{\partial\psi}\frac{\eta}{\eta+1}\times\left[\frac{\mathcal{L}_{31}}{\eta}+R_{pe}(\mathcal{L}_{31}+\mathcal{L}_{32})+(1-R_{pe})(1+\alpha)\mathcal{L}_{31}\right],$$

where the fact that $L_{34}\approx L_{31}$ has been used and the terms in the square brackets have been grouped such as to give the relative contributions due to the density, electron temperature and ion temperature gradients, respectively. This gives a simple dependence of the bootstrap current on the plasma profiles. Using the typical parameters mentioned above, in the limit of flat density profiles like in high confinement modes (H modes) ($\eta\rightarrow\infty$), one gets a coefficient of 0.28, whereas for similar temperature and density scalelengths ($\eta=1$) one gets 0.39, that is about 50% more bootstrap current due to the contribution from the density gradients.

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