

Erratum: Trapped-Particle Asymmetry Modes in Single-Species Plasmas [Phys. Rev. Lett. 87, 225002 (2002)]

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The fluid motion of Eq. (3) is written in a form that inadvertently omits a contribution from the rise in the trapped (and fall in the untrapped) particle density at the interface between trapped and untrapped particles (i.e., at $r = r_s$). The equation should read

$$\frac{1}{r} \frac{\partial}{\partial r} \left(r \frac{\partial}{\partial r} \delta\phi_j \right) - \frac{m^2}{r^2} \delta\phi_j = \frac{2ec}{Br} \frac{m}{mf_E - f} \left(\delta\phi_j \frac{\partial n_t}{\partial r} + \delta\phi_b \frac{\partial n_u}{\partial r} \right) + \frac{4\pi e^2 n_u}{T} (\delta\phi_j - \delta\phi_b), \quad (1)$$

where the trapped and untrapped densities are written in terms of Heaviside step functions Θ as

$$n_t(r) = n_0(r)\Theta(r - r_s) \quad (2)$$

and

$$n_u(r) = n_0(r)\Theta(r_s - r). \quad (3)$$

The dispersion relation of Eq. (4) for top hat density profiles [$n_0(r) = n_0\Theta(R_p - r)$] then becomes

$$\begin{aligned} & \left(\frac{R_p}{r_s} \right)^m \left(\frac{I_m}{f'} + \frac{r_s I_{m-1}}{2m\lambda_D} \right) \left(\frac{R_w^{2m}}{R_p^{2m} - R_w^{2m}} + \frac{1}{f'} \right) \\ & - \left(\frac{r_s}{R_p} \right)^m \left(\frac{I_m}{f'} + \frac{r_s I_{m+1}}{2m\lambda_D} \right) \left(\frac{R_p^{2m}}{R_p^{2m} - R_w^{2m}} + \frac{1}{f'} \right) = 0, \end{aligned} \quad (4)$$

where $I_m \equiv I_m(r_s/\lambda_D)$ are modified Bessel functions of the first kind and $f' \equiv m - f/f_E$. This new dispersion relation has two solutions, with only the lower frequency solution being relevant here.

The remaining discussion and results in the paper are not affected by this correction, since the two dispersion relations are equivalent in the limit of $\lambda_D \rightarrow 0$, and the correct equation was used in the kinetic treatment for comparison to experiments.