CORRIGENDUM

J. Lemaire and M. Roth: 'Non-Steady-State Solar Wind-Magnetosphere Interaction', *Space Science Reviews* **57**: 59–108, 1991

Page 81, Equation (8)

Replace in right-hand side ρ by $\rho \mathbf{v}$.

Page 92, Figure 16

The arrows representing the field-aligned currents in Figure 16 for the case of impulsive penetration of a plasmoid in the magnetosphere must be reversed as indicated in the corrected figure. In the case of the spontaneous blow-up of a so-called 'Flux Transfer Event', it is presumed that the direction of the associated field-aligned currents (Birkeland currents) is opposite to those induced by the impulsive penetration of an external plasmoid as a consequence of an excess of momentum density.

The directions of the Pedersen currents ($\mathbf{I}_{\mathrm{Ped}}$) flowing from east to west in the E-region have been added to the new version of Figure 16. For completeness we have added also the direction of the polarisation currents ($\mathbf{I}_{\mathrm{pol}}$) which create the net positive surface charge density at the eastward side of the plasmoid and negative charges at the westward side; these polarisation currents are generated according to the mechanism described by Schmidt (1960). Polarisation currents are flowing in a direction opposite to the convection electric field inside the moving plasmoid. This implies that $\mathbf{I}_{\mathrm{pol}} \cdot \mathbf{E} < 0$, i.e., that a penetrating plasmoid acts as a dynamo or current generator.

Finally, in the new version of Figure 16 the arrows ($\mathbf{V}$) represent the plasma bulk velocity; it is directed anti-Sunward inside the injected plasmoid, but magnetospheric plasma outside moves Sunward around the plasma element as illustrated in Figure 7 of the article.

Note that arrows have been added in this figure to indicate the possible expansion velocity of the intruding plasma element along the magnetic field lines, in case the plasma pressure inside the injected solar wind plasma entity is larger than that outside in the LLBL.

We thank Rickard Lundin for his comments on Figure 16 illustrating the electric circuit system which should be associated with impulsive penetration of solar wind plasma density enhancements into the frontside magnetosphere. Note that similar currents and electric fields can be associated with magnetopause indentations which are produced by sporadic solar wind pressure variations as envisaged by Sibeck *et al.* (1989a, b), Sibeck and Croley (1991), and Kivelson and Southwood (1991). But in these latter cases the authors claim that there would be no penetration of magnetosheath-like plasma onto 'closed' LLBL magnetic field lines.

Space Science Reviews **58**: 377–378, 1991.

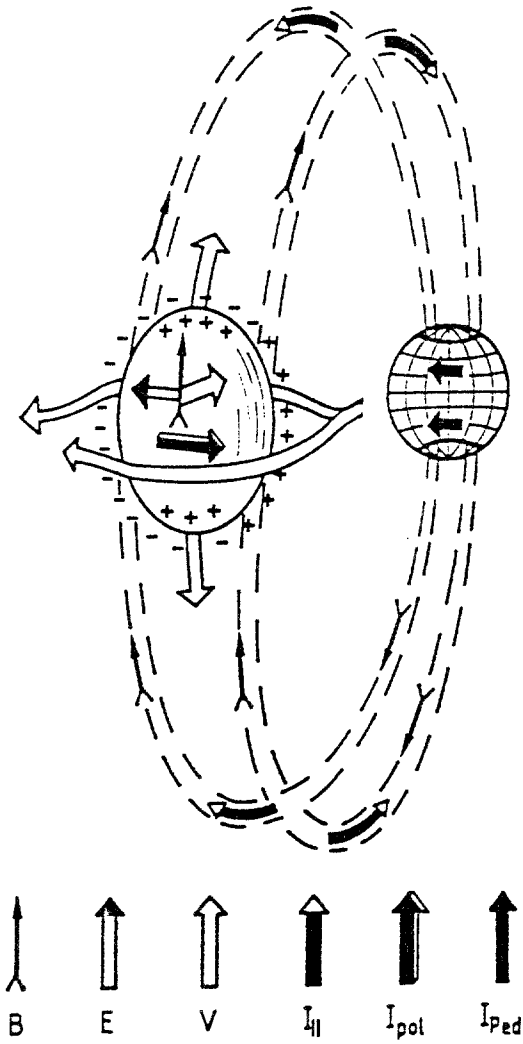

Fig. 16. Three-dimensional structure of a penetrating plasmoid. The latter is representated by a spherical plasma entity instead of the volume of a magnetic flux tube. Electric field (**E**) and magnetic field (**B**) directions are indicated by different types of vectors; similarly the plasma bulk velocity (**V**) and the different kinds of electric currents are also sketched: field-aligned currents ($\mathbf{I}_{\parallel}$), Pedersen currents ($\mathbf{I}_{\mathrm{Ped}}$), and polarisation currents ($\mathbf{I}_{\mathrm{pol}}$).

References

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Sibeck, D. G., Baumjohann, W., Elphic, R. C., Fairfield, D. H., Fennell, J. F., Gail, W. B., Lanzerotti, L. J., Lopez, R. E., Luehr, H., Lui, A. T. Y., Maclennan, C. G., McEntire, R. W., Potemra, T. A., Rosenberg, T. J., and Takahashi, K.: 1989a, *J. Geophys. Res.* **94**, 2505.

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