Correction to "Evolution of auroral asymmetries in the conjugate hemispheres during two substorms"

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[1] In the paper "Evolution of auroral asymmetries in the conjugate hemispheres during two substorms" by *Østgaard et al.* (*Geophysical Research Letters*, *38*, L03101, doi:10.1029/2010GL046057, 2011), the geometry presented in Figure 3b is not correct. Instead, the geometry first suggested by *Stenbaek-Nielsen and Otto* [1997] and shown here in Figure 1 should be used. For Interplanetary Magnetic Field (IMF) $B_y < 0$, *Stenbaek-Nielsen and Otto* [1997] derived, according to Ampere's law, a north-to-south interhemispheric field aligned current (FAC) in the region of auroral arcs and a south-to-north FAC at the inner edge of the plasma sheet that maps to the region of region 2 currents (Figure 1). Applying this geometry to the case study presented by *Østgaard et al.* [2011] would imply that a net FAC from the north to the south in the region of auroral arcs and the rest of the argument based on integrating the Faraday's law along a loop of two closed field is still valid.

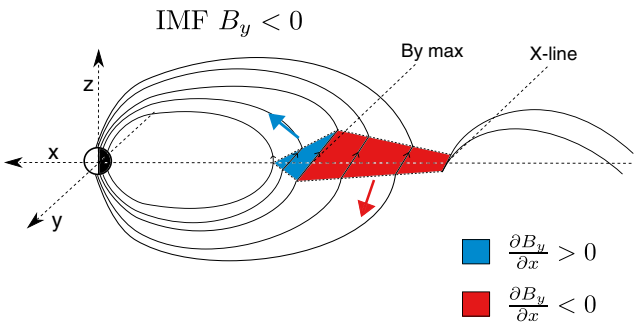

Figure 1. Sketch of how IMF $B_y < 0$ will penetrate the magnetosphere and extend to close field lines, similar to Figure 4 in *Stenbaek-Nielsen and Otto* [1997]. In this sketch, the entire B_y component is shown in the equatorial plane to make our point clearer. The penetration has a maximum in the region of discrete aurora and decreases towards the tail and at the inner edge of plasma sheet, giving a south-to-north current at the inner edge of the plasma sheet and a north-to-south current in the auroral region for IMF $B_y < 0$.

References

Østgaard, N., B. K. Humberset, and K. M. Laundal, Evolution of auroral asymmetries in the conjugate hemispheres during two substorms, *Geophys. Res. Lett.*, *38*, L03101, doi:10.1029/2010GL046057, 2011.

Stenbaek-Nielsen, H. C., and A. Otto, Conjugate auroras and the interplanetary magnetic field, *J. Geophys. Res. Lett.*, *102*, 2223–2232, 1997.

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