Correction to Paper by Milo A. Schield, 'Pressure Balance between Solar Wind and Magnetosphere'

MILO A. SCHIELD

Department of Physics and Astronomy
The University of Iowa, Iowa City, Iowa 52240

The magnetic field of the quiet-day ring current was presented as the Appendix of my paper [*Schield*, 1969]. This field was obtained using *Kavanagh*'s [1967] RING program, which integrates over a symmetric distribution of particles moving in a dipole magnetic field. The ring current field near the earth also was calculated using the total energy of these particles and Sckopke's relation [*Sckopke*, 1966]. The 23% difference between these two fields at the earth's surface was ascribed to a neglect of the field energy of the ring current.

N. Sckopke (personal communication) has pointed out that both calculations are first order and thus should give identical results. The observed difference could not be ascribed to the field energy of the ring current and indeed was an indication of an error in the computer calculation. I agree. Therefore the RING program was checked and an error identified. Statement 703 should be divided by S433 instead of SOSQ (L. D. Kavanagh, Jr., personal communication).

The corrected results are shown in the accompanying figure. The 28.4-γ surface field calculated by RING is within 13% of 32.4-γ field predicted using Sckopke's relation and an equatorial dipole field of 0.31 gauss. This correction decreased the magnetic moment of the quiet-day ring current from 0.26 M_E to 0.21 M_E, 86% of which is contained by the low-energy protons ($E \leq 50$ kev). On this basis the subsolar magnetic field would be decreased by 4%, and the required solar wind density would be decreased by about 8%. However, this correction also increased the size of the nondipolar component near 11 R_E to more than 10% of the dipole field.

In summary, these small offsetting changes

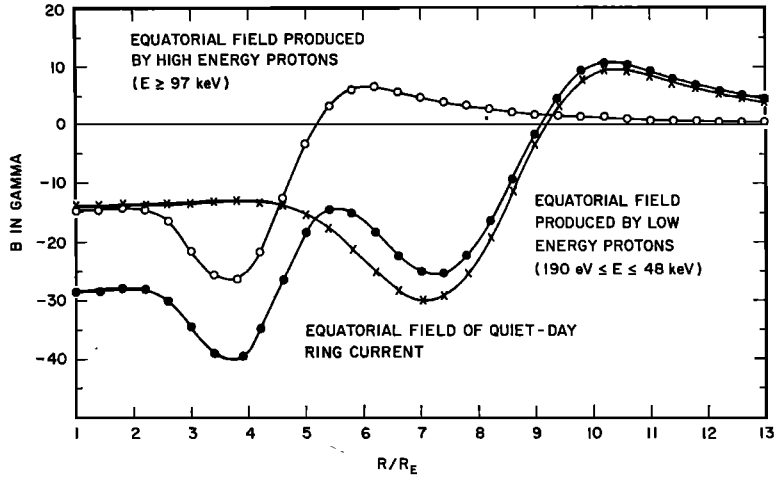

Fig. 1. Equatorial field of the quiet-day ring current obtained as the sum of the fields produced by the high- and low-energy components of the magnetospheric plasma. Inclusion of protons between 50 and 100 kev should smooth out the bump at $L = 5$.

do not alter any of the conclusions presented concerning the predicted density of the solar wind.

I would like to thank Mr. Sckopke for pointing out the source of this error.

References

Kavanagh, L. D., Jr., Predicted and observed displacements and energy changes of charged particles after distention of the magnetosphere by a symmetric ring current, Ph.D. thesis, Rice University, Houston, Texas, 1967.

Schield, M. A., Pressure balance between solar wind and magnetosphere, *J. Geophys. Res.*, *74*, 1275, 1969.

Sckopke, N., A general relation between the energy of trapped particles and the disturbance field near the earth, *J. Geophys. Res.*, *71*, 3125, 1966.

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