PERGAMON

Journal of Atmospheric and Solar-Terrestrial Physics 63 (2001) 2007

Journal of ATMOSPHERIC AND SOLAR-TERRESTRIAL PHYSICS

www.elsevier.com/locate/jastp

Corrigendum

Corrigendum to "Hydrostatic equilibrium and convective stability in the plasmasphere" [Journal of Atmospheric and Solar-Terrestrial Physics 61 (1999) 867–878] ☆

J.F. Lemaire *

Institut d' Aeronomie Spatiale de, Belgique, 3 Avenue Circulaire, B-1180 Brussels, Belgium

This figure replaces Fig. 4 of p. 872 in the article referred above. Although the instability thresholds are the same in both figures, the shadings have been corrected for $L > L_0 = 6.6$. The new figure confirms that a corotating protonosphere in hydrostatic/barometric equilibrium becomes convectively unstable beyond this equatorial distance (i.e. geosynchronous orbit).

Beyond this radial distance, both pure interchange plasma motions (as described by Gold, 1959; Tserkovnikov, 1960) and quasi-interchange plasma motions (as described by Newcomb, 1961) are unstable for any (negative) density slope/gradient larger than the values given by the dashed and dotted lines, respectively: i.e. when the density scale height within an embedded volume element is smaller than the threshold values corresponding to the dashed and dotted lines, respectively.

The legend of this new Fig. 4 is unchanged, as well as the text of the article itself, except for a typographical error on p. 871 (line 7 in the column of the right-hand side) where $-\mathrm{d}\ln m/\mathrm{d}z$ should be replaced by $-\mathrm{d}\ln n/\mathrm{d}z$.

From this new figure it is clear that the geosynchronous distance is a crossover location where any negative density slope becomes convectively unstable with respect to both convective instabilities in a corotating protonosphere or plasmasphere in hydrostatic/barometric equilibrium. Note that the effect of B-field line curvature on these stability criteria will be addressed in a paper currently in preparation.

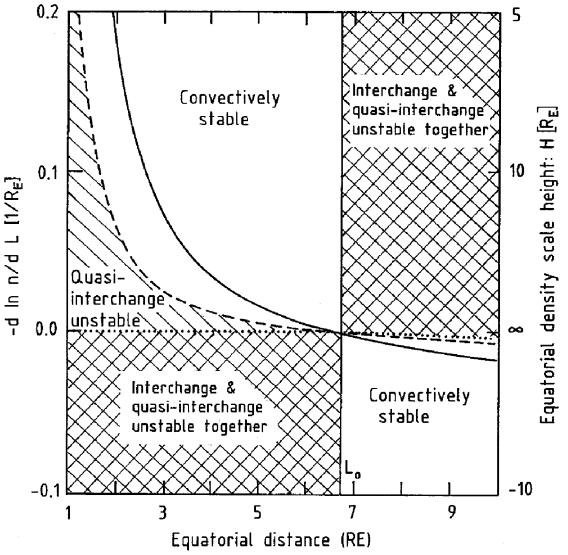

Fig. 4.

Acknowledgements

I Wish to thank Dr. Vladimir Cadez for pointing out to me the mistake in the former Fig. 4.

☆ PII of the original article: S1364-6826(99)00044-9

* Tel.: +32-2-373-0407; fax: +32-2-374-8423.

E-mail address: ji@oma.be (J.F. Lemaire).

PII: S1364-6826(01)00076-1