

A SYMMETRIC PROBE FOR MEASUREMENT OF FIELD ALIGNED DRIFTS IN MAGNETIZED PLASMA

Fiala V.⁽¹⁾, Jásenský V.⁽¹⁾, Váňa O.⁽¹⁾

⁽¹⁾ *Institute of Atmospheric Physics, Czech Academy of Sciences, Czech Republic, E-mail: vjas@ufa.cas.cz*

ABSTRACT

R-F probes operated in frequency band around lower oblique resonance in magnetized plasma were suggested by Kuehl [1] and Storey & Thiel [2] as a tool for measurement of field aligned drifts. We elaborate on these previous studies in two ways. We propose a symmetric layout of the probe, with one receiving electrode downstream and the other upstream from the transmitting sphere. In such a case the probe response is due solely to drift effects. Also, we include an electromagnetic correction to the wave dispersion, which makes the phase and group velocity of the lower oblique resonance mode finite. This fact is of importance for correct evaluation of drift effects on the excited wave field. Results of numerical calculations of the response of this probe for plasma parameters corresponding to the polar ionosphere and magnetosphere will be presented and possibility of such measurements assessed.

REFERENCES

- [1] Kuehl H.H.: *Electric field and potential near the plasma resonance cone*, Phys. Fluids, 1974, vol.17, 1275-1284.
- [2] Storey L.R.O., Thiel J.: *Thermal and field-aligned-drift effects near the lower oblique reonance*, Phys. Fluids, 1978, vol.21, 2326-2335.