THE FARADAY EFFECT AND THE VARIARION OF TOTAL ELECTRON CONTENT NEAR THE EQUATOR

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ABSTRACT

The Appleton-Hartree expressions for the polarisation (of a plane radio wave in a non-isotropic medium) and the refractive index (of a characteristic wave) are derived from standard Magnetoionic Theory. The Faraday rotation of the plane of polarisation of a linearly polarised radio signal is considered and the formula for calculating the Total Electron Content of the ionosphere for the case of quasi-longitudinal conditions is derived. Although the quasi-transverse region forms a small fraction of the latitude coverage for each Faraday record analysed, it is discussed in a fair amount of detail. The Total Electron Content values derived from observations are looked at in various ways, including,

diurnal variation,
magnetic activity effects,
seasonal variation.

The results are examined for evidence of the 'Equatorial Anomaly' in the Total Electron Content of the ionosphere.