

Abstract Submitted
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Development of a methodology for deriving Plasmaspheric Total Electron Content from In-Situ electron density measurements in highly eccentric equatorial orbits ALIYUTHUMAN SADHIQUE¹, ANDREW BUCKLEY², PAUL GOUGH³, Univ of Sussex, SUSSEX SPACE SCIENCE CENTRE TEAM — The contribution of the Upper Plasmasphere (defined as the altitudes above semi-synchronous orbit height to the Plasmapause height) to the TEC has been and continues to be un-quantified. The PEACE instrument in the Chinese – ESA Double Star TC1 satellite, the mission’s orbit’s high eccentricity, low perigee, high apogee and the resulting smaller incident angle while in the above altitude range provide the ideal geometric opportunity to build a methodology and to utilize its empirical in-situ electron density measurements to determine the Upper Plasmaspheric TEC component. Furthermore, the variation of the Inclination Angle of TC1 makes it a suitable equatorial mission confined to the Near-Equatorial region, ie 20^0 - 25^0 on either sides of the magnetic equator. As the most pronounced absolute TEC values and variations are within this region, it offers an excellent opportunity to build a Upper Plasmaspheric TEC database. This research generates such, first-ever database along its orbital path, using a methodology of approximation equating arcs of the orbits to straight-line TEC Bars, utilizing complex mathematics, also enabling the determination of the whole Plasmaspheric TEC from any eccentric orbital probe

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