

Aspects of Electron Density Profiles measured by RO of FORMOSAT-3/COSMIC Satellites and Digisonde over Cyprus

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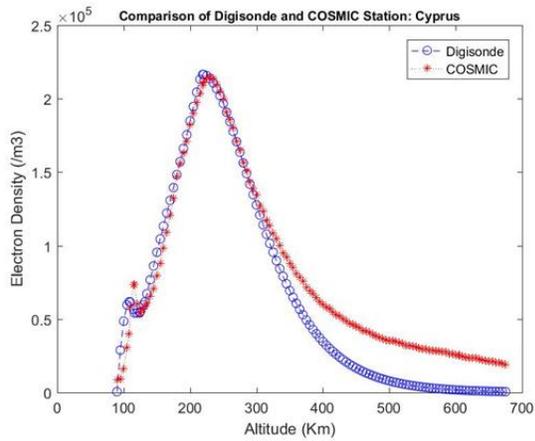
ABSTRACT

This study represents aspects of collocated ionospheric measurements by FORMOSAT-3/COSMIC satellites in terms of GPS radio occultation technique and ionosonde performing vertical soundings over Cyprus. The purpose of this investigation is to explore the electron density discrepancy in the bottomside and topside ionosphere as measured by these two different techniques and the conditions that give rise to this discrepancy. Electron density profiles measured by FORMOSAT-3/COSMIC Radio Occultation (RO) technique and digisonde over Cyprus (latitude: 35° N, longitude: 33° E geographic) are utilized. This study is based on a dataset of several hundreds of electron density profiles in the period 2009-2015. The selection cases considered correspond to COSMIC radio occultation measurements at various collocation distances of COSMIC-digisonde position at less than 15 min time difference in the F2 layer peak measurement.

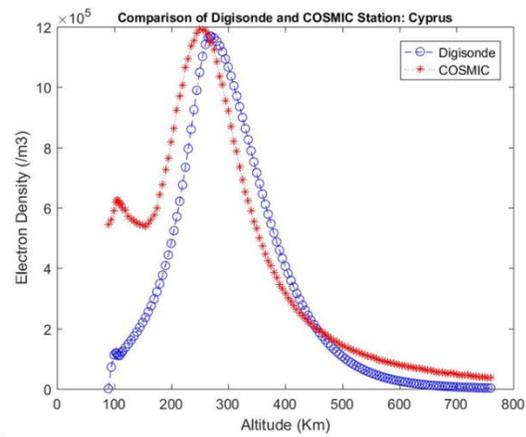
Key words: FORMOSAT-3/COSMIC, Ionosonde, GNSS, foF2, NmF2

Results:

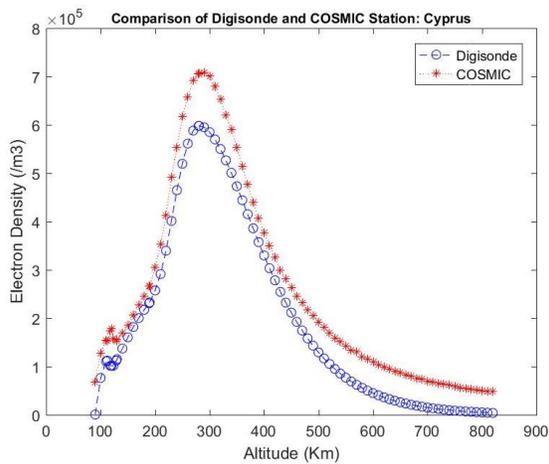
Figure 1 show sample plots of Digisonde-COSMIC electron density profiles observed over Nicosia, Cyprus. It is clearly evident that a various levels of agreement are obtained in topside as well as in the bottomside profiles.



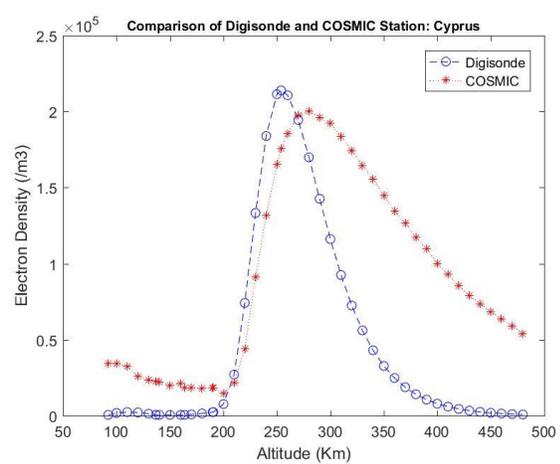
(a)



(b)



(c)



(d)

Figure 1. Digisonde-COSMIC profiles over Cyprus with (a) good match in foF2 and hmF2 (b) good match in foF2 and slight mismatch in hmF2 (c) mismatch in foF2 and good match in hmF2 (d) mismatch in both foF2 and hmF2.

References:

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