



Effect of Solar Eclipse of March 20, 2015 on the Ionosphere

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The effect on the ionosphere of solar eclipse of March 20, 2015 on different ionospheric layers has been studied, using the vertical ionospheric soundings from the ionosondes of Rome, Gibilmanna and San Vito dei Normanni. The response of the critical frequencies foF1 and foF2 have been investigated during the solar eclipse. The DuCharme and Petrie's formulation used to estimate foF1 has been corrected taking into account the decreased solar irradiance. This effect has been modeled by a Solar Obscuration Factor (SOF) and comparison with experimental values has been performed. A further study on the occurrence of the Sporadic E layer during the eclipse is here presented. As reported in literature, sporadic E layer appears during the eclipse, if the ionograms for 3 days before and 3 days after are analysed. When a wider set of days before and after the eclipse event are taken into account this phenomenon does not appear so clear. The behaviour of a regional adaptive and assimilative 3D ionospheric model has been tested as well, assimilating plasma frequency profiles $f_p(h)$. The study of the model behaviour in such particular condition has let us introduce corrections to F1 and E region modeling, improving its performances.