

# TEC FORECASTING OVER EUROPEAN LATITUDES WITH USE OF SEVERAL PREDICTIONS METHODS

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In this paper the TEC time series obtained from GPS permanent observations of ionospheric quiet and disturbed conditions at different European stations: Onsala (57N, 12E), Metsahovi (60N, 24E) Hailsham (51N, 0E), Lamkowko (54N, 21E), Borowa Gora (52N, 21E), Borowiec (52N, 17E) and Matera (40N, 16E) for the half of the solar cycle period from 1995 (minimum solar activity) to 2001 (maximum solar activity) years were analysed.

The comparison of different prediction methods like: the autocovariance, the autoregressive moving average (ARMA), the similar pattern (SP) and the least squares (LS) have been done for Vertical Total Electron Content (VTEC) forecasting. The forecasts of the TEC time series for the considered stations were computed for one, two three, four hours ahead at a single european GPS permanent station and compared with the corresponding future values of the TEC data. Sample of the results for representative periods (for minimum, increasing and maximum solar activity) are presented.

All above mentioned forecasting methods provide an acceptable accuracy. The accuracy of the prediction depends on the starting prediction epochs, the ionospheric conditions and for a few hours in the future it is of the order of 5 percent of the real TEC values over the GPS station. These methods are very simple and do not need any information a-priori about the process as well as additional inputs such as the solar or magnetic activity indices.