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Testing of the THERION method with Millstone Hill ISR hmF2 observations

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Millstone Hill ISR noontime h_mF_2 observations in 2000-2016 have been used to test the THERION (Thermospheric parameters from Ionosonde observations) method. Input parameters were read from $f(h)$ height profiles scaled from ionograms with the Autoscala program.

The THERION method retrieves a self-consistent set of the main aeronomic parameters, h_mF_2 in particular. Overall 60 dates under various solar and geomagnetic activity levels have been selected for the analysis. The retrieved h_mF_2 values demonstrate a standard deviation equals to 10.6 km and this is close to the expected inaccuracy of h_mF_2 determination. The correlation coefficient between the retrieved and observed h_mF_2 is 0.937±0.051 which is significant at the confidence level > 99.9%.

The undertaken analysis has confirmed the earlier obtained conclusion on the possibility to extract the main aeronomic parameters from routine ionosonde observations.