



DIAS effective sunspot number as an indicator of the ionospheric activity level over Europe

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DIAS (European Digital Upper Atmosphere Server) effective sunspot number, R12eff, was recently introduced as a new tool for regional ionospheric modelling. Although it was initially suggested as a pre-processing step for the update of the Simplified Ionospheric Regional Model (SIRM) to real time conditions, it can be independently exploited in various applications for both ionospheric forecasting and nowcasting purposes. In this paper we discuss the efficiency of R12eff provided by DIAS system (<http://dias.space.noa.gr>) to specify ionospheric conditions over Europe in real time. More precisely, the diurnal variation of R12eff during quiet conditions is determined on monthly basis and for different solar cycle phases in an effort to establish R12eff's reference pattern. The deviation of the real-time R12eff estimates from the determined quiet pattern is further investigated as an indicator of the level of the ionospheric activity over Europe. According to our findings, this deviation maps successfully the ionospheric response especially during large scale effects, such as prolonged negative and positive effects detected all over Europe. Some limitations are imposed for small scale effects, such as positive effects of short duration observed locally, but in general the results indicate that DIAS effective sunspot number is a reliable estimator of the ionospheric disturbance level over a substantial part of Europe and therefore R12eff could be a powerful tool for ionospheric specification applications and a useful contribution of DIAS system to EURIPOS objectives.