

Periodic variations in the influence of Ly radiation on the ionospheric D-region

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Solar hydrogen Ly alpha photons are the dominant source of ionization in the upper ionospheric D-region during quiet conditions. In this paper, we present a new procedure for modeling the parameters of a quiet D-region at different periods of the day, year, and solar cycle. This procedure requires monitoring of the D-region by two very low/low frequency (VLF/LF) signals emitted and recorded by relatively closely located transmitters and receivers. We provide analytical expressions for Wait's parameters over the part of Europe included within the location of the transmitted signals (Sardinia, Italy, for the ICV signal) and (Lower Saxony, Germany for the DHO signal) and the receiver in Belgrade, Serbia. The developed model enables the determination of the influence of the number of sunspots and days in the year on the midday ionospheric parameters. Their variations during a daytime period are calculated based on data related to the amplitude and phase of one VLF/LF signal recorded by one receiver.