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Recovery of Neh profile from chirp-ionogramm using IRI model

Ruslan Latypov, Vladimir Bochkarev, Inna Petrova, Adel Akchurin, and Ruslan Zukov
Institute of Physics, Kazan (Volga region) Federal University, Kazan, Russian Federation

A lot of attention was given to the ionosphere when it was discovered in the beginning of the 20th centenary. Ionospheric measurements in the middle and upper atmosphere of the Earth was a problem that interested different researchers (science and military), but with the development of new ways of communication, such as satellite, the interest to the ionosphere began to decline. Currently, due to the need of communication high quality, relevance of research in the ionosphere increases, as it is a medium where radio wave propagating. Modern research and communication equipment allow us to study the ionosphere at new level. The objects of study in such researches are not only ionosphere, as medium of propagation, but also processes occurring within the ionospheric plasma. Due to its location and the internal structure of the ionosphere is very sensitive to magnetic and electric fields, the effects of corpuscular streams, such as solar, because of this it has good diagnostic capabilities for surveillance and monitoring not only the external cosmic influences, but also the interior with earth nature (including human influence).
One of the methods of ionospheric research is sounding with continuous linear frequency modulated signal. Ionogramms obtained from such sounder is not easy to explain, as vertical ionosonde ionogramms. In this paper we show one of the approach to interpret chirp-ionogramms. We simulate propagation of radiobeam using IRI model. Simulation gives us a group of trajectories for different frequencies for selected points of transmitter and receiver. Each trajectory is founded from simulation in which radiobeam of selected frequency is sent with different angles (azimuthal and elevation) in the direction of receiving point. In the result of simulation we construct chirp-ionogramm from modeling data. Comparison with real ionogramm allow as to explain some of the traces and automatically give us Neh profile recovered from the IRI model.