Numerical modeling of cosmic noise absorption in artificially modified ionosphere volume

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Observations of the cosmic noise absorption are widely used for studies of energetic electron precipitations. However, the absorption depends not only on electron density in the D- and lower E-regions of the ionosphere. Electron temperature also plays significant role on the riometer data. Natural variations of the temperature are not too strong, and usually they are not taken into account. On the other hand during active experiments on the ionosphere electron heating this parameter can be changed by factor 10 and more. The numerical estimation of the influence of the modified temperature especially important for interpretation imagine riometer IRIS because it has 49 narrow beams, one of them directed to the ionospheric area over Tromso has the spatial scale compatible with the heated volume. The calculations of the riometer absorption have been made for radio wave frequency 38.2 MHz for the conditions of the EISCAT-Heating experiment on November 19, 1998. EISCAT measurements of the electron density are used as input parameter for the modeling. For the calculations of the electron temperature the pump wave frequency 5.423 MHz in x-mode and ERP (effective radiated power) 900 MW are used. Our estimations show that differences in the absorption of the modified ionosphere and the undisturbed one are not more than 0.2 dB.