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Oblique ionograms automatic scaling and eikonal based ray tracing

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The problem of automatic scaling of oblique ionogram traces is considered using the maximum contrast method, as used in Autoscala program and introducing a new set of empirical curves. The results of numerical experiments on a limited data set of ionograms are presented. The electron density distribution along the path is estimated by a ray tracing procedure based on the eikonal equation. For this purpose, for some selected frequencies we use a homing algorithm calculating the time t elapsed from the transmitter to the receiver. Different kind of ionospheric models have been considered, such as the parabolic one, which is a basic approximation of F2 layer, and a more complex model derived from the International Reference Ionosphere. Using our simulations to compute t for each frequency, we obtain simulated oblique ionograms. Results of comparison of simulated oblique ionograms to the recorded are presented.