Improvement of the electron density automatic estimation algorithm in the ionosphere lower region

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In the lower ionosphere, the approximate electron density profile can be estimated from the comparison between these observation results obtained by sounding rocket and propagation caracteristics calculated with Full wave method. This estimation process, which is so-called ”wave absorption method”, has some problems. At first, we have no clear standard for comparing observation results and propagation characteristics calculated with Full wave method. In addition, we have to iterate many times correcting the electron density profile by handwork, calculating propagation characteristics with Full wave method and comparing observation results and calculated propagation characteristics. This iteration takes too long to estimate appropriate electron density profile. To reduce these problems, we developed an application to realize automated estimation of electron density profile by analyzing radio wave propagation characteristics.
In the past of the research, they were estimated electron density by automated estimate application. In the result, I realized high accuracy estimation because error was within 1.2 dB in all estimated area. And it can estimate at short time. However there was a large fluctuation of the electron density in low-altitude part. This is impossible in actual observation. So, we did consideration and improvement to algorithm.

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