



OIASA application to oblique radio-sounding data recorded in Korea

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The Oblique Ionogram Automatic Scaling Algorithm (OIASA) has been applied to a data set of oblique ionograms recorded by the Vertical Incidence Pulsed Ionospheric Radar, Version 2 (VIPIR2) ionosonde receivers in Korea. These ionograms are the result of the real-time oblique radio-soundings performed every 15 minutes between the Japanese National Institute of Communications Technology ionospheric stations of Kokubunji (35.71°N, 139.46°E), Yamagawa (31.18°N, 130.59°E), Ogimi (26.70°N, 128.12°E), and Sarabetsu (45.18°N, 141.76°E), and the Korean Space Weather Center stations of Icheon (37.14°N, 127.55°E) and Jeju (33.43°N, 126.29°E). A set of 96 poor-quality test mode ionograms for each of the 8 different radiolinks has been selected for this study, and the results are presented.

In order to scale the Maximum Usable Frequencies (MUF) between the receiving and the transmitting ionosondes, a filtering procedure for the ionograms noise reduction has been applied in combination with an image recognition technique. Vertical equivalent ionograms have been obtained using Martyn's equivalent path theorem, and processed by Autoscala. A quality factor Q for the autoscaled MUF values has been identified, based on the comparison of Autoscala foF2 values and those obtained applying the secant law to the autoscaled MUF values themselves. Using the receiver operating characteristic curve, an appropriate threshold level Q_t has finally been chosen for Q in order to discard unreliable MUF values, decreasing the false positive event percentage.