

VIPIR ionospheric observations in Japan

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National Institute of Information and Communications Technology (NICT) has observed ionosphere by ionosondes more than 70 years in Japan. At present, four ionosondes at Wakkanai (Sarobetsu), Kokubunji, Yamagawa, Okinawa (Ogimi) are automatically operated and controlled from Tokyo. Major ionospheric parameters such as foF2 and foEs are scaled from the ionograms automatically on a real-time basis and scaled manually for the final values. The scaled parameters are provided through our web site [1]. In 2017, we replaced the previous ionosondes with Vertical Incidence Pulsed Ionospheric Radar 2 (VIPIR2). One of the advantages of VIPIR2 is a receiving antenna array, which makes it possible to separate O-mode from X-mode by utilizing in-phase and quadrature data. The O/X mode separated ionograms are used for automatic scaling with artificial intelligence (AI) technique. The scaling accuracy and the successful rate have been largely improved. In addition, we changed the observation interval from 15 minutes to 5 minutes. This made possible to capture much finer variations whose time scale is less than 15 minutes. We have also tried to detect arrival directions of ionospheric echo by using the 8ch receiving data as an interferometry.

In this presentation, we will overview the status of ionospheric observation in NICT.

[1] <https://wdc.nict.go.jp/IONO/HP2009/ISDJ/index.html>

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