

## Recent activity and future plan of ionospheric observation in NICT

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National Institute of Information and Communications Technology (NICT) has been observing ionosphere by ionosondes for over 70 years in Japan. At present, four ionosondes at Wakkanai(Sarobetsu), Kokubunji, Yamagawa, Okinawa(Ogimi) are automatically operated and controlled from Tokyo. We have been replacing the current 10C type ionosondes with Vertical Incidence Pulsed Ionospheric Radar 2 (VIPR2) ionosondes which can separate the O-mode and X-mode ionospheric echoes automatically. In addition to ionosonde observations, we have developed two-dimensional total electron content (TEC) observation technique over Japan using the dense GNSS network, GEONET since mid-1990s. The TEC maps are now available on a realtime basis using streaming data of GEONET. We have developed ionospheric storm monitoring system based on the realtime observation data and a new ionospheric storm scale, I-scale, which is defined using the long-term ionospheric data in Japan. In addition to the ionospheric observations in Japan, we have developed the Southeast Asia low-latitude ionospheric network (SEALION) for the purpose of monitoring and researching severe ionospheric disturbances, such as plasma bubble. SEALION mainly consists of five FMCW ionosondes in four countries in Southeast Asia: Chiang Mai and Chumphon (Thailand), Kototabang (Indonesia), Bac Lieu (Vietnam) and Cebu (Philippines). We are now developing a new FMCW ionosonde system which is GNU Radio based software defined system. Observations of HF transequatorial propagation between Japan and Australia have also been used to research the generation and propagation characteristics of plasma bubbles. In this presentation, we will introduce recent activity and future plan of ionospheric observation in NICT.

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