

D領域・下部E領域電離圏モニタリングのためのアジアVLF観測ネットワーク (AVON) Asia VLF Observation Network (AVON) system for monitoring the D- and lower E-region ionosphere

大矢 浩代^{1*}, 土屋 史紀², 山下 幸三³, 高橋 幸弘⁴, 塩川 和夫⁵, 三好 由純⁵, 中田 裕之¹

OHYA, Hiroyo^{1*}, TSUCHIYA, Fuminori², YAMASHITA, Kozo³, TAKAHASHI, Yukihiro⁴, SHIOKAWA, Kazuo⁵, MIYOSHI, Yoshizumi⁵, NAKATA, Hiroyuki¹

¹ 千葉大学大学院工学研究科, ² 東北大学大学院理学研究科, ³ サレジオ工業高等専門学校電気工学科, ⁴ 北海道大学大学院理学研究院, ⁵ 名古屋大学太陽地球環境研究所

¹Graduate School of Engineering, Chiba University, ²Graduate School of Science, Tohoku University, ³Department of Electrical Engineering, Salesian Polytechnic, ⁴Graduate School of Science, Hokkaido University, ⁵Solar-Terrestrial Environment Laboratory, Nagoya University

We introduce Asia VLF Observation Network (AVON) system. The observation targets of the AVON are the D- and lower E-region ionosphere, lightning activities, and ionospheric disturbances associated with lightning in Southeast Asia. In this study, we show the results of the D- and lower E-region ionosphere. The observation system is installed at three sites: Tainan site (23.08N, 120.12E) in Taiwan, Saraburi site (14.53N, 101.03E) in Thailand, and Pontianak site (0.00N, 109.37E) in Indonesia. In addition, we have a plan to install the observation system at Laoag in Philippine and Hanoi in Vietnam in 2012. At each site, we use a dipole antenna for the electric field measurements and an orthogonal loop antenna for the magnetic field measurements. At Tainan, Saraburi, and Pontianak sites, LF transmitter signals are observed with a monopole antenna. With a set of orthogonal loop and dipole antennas, tweek atmospherics (0.1 - 10.0 kHz) and broadband lightning atmospherics (1.0-40.0 kHz) are obtained. Analyzing the VLF/LF data obtained by AVON, we estimate the reflection heights of each signal. The reflection height corresponds to variations in electron density in the D- and lower E-region ionosphere in Southeast Asia. This network system is utilized in cooperation with other ground-based and satellite-based observation projects to investigate energetic-particle precipitation effects on low-latitude ionosphere. In the presentation, we introduce the AVON system and show the results of a magnetic storm of 2-12 May 2010, total solar eclipse of 22 July, 2009, and long recovery events of LF transmitter signals.