

R005-30

B会場 : 9/25 PM1 (13:45-15:30)

14:45~15:00

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The Use of Ionosonde for Forecasting Post-Sunset Equatorial Plasma Bubbles: An Observational Experiment in Southeast Asia

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Equatorial plasma bubbles (EPBs) can negatively affect space-based technological systems. This study investigates the potential of ionosonde to forecast the occurrence of post-sunset EPBs in the zonal direction using observational data from four ionosondes near Southeast Asia's magnetic Equator. A logistic regression model was used to establish a relationship between the probability of post-sunset EPB occurrence and the evening vertical plasma drift (v). Results show that the probability of EPB occurrence is close to zero, or the EPB cannot be generated when v is negative. Conversely, when v is stronger than 30 m/s, the probability of EPB occurrence is greater than 0.90, meaning that EPB almost always occurs. The probability of EPB occurrence is 1 when v is greater than or equal to 40 m/s. Using this model, the study found that a single ionosonde in the Equator can optimally forecast the occurrence of EPBs up to a longitudinal distance of 30 deg from its position. The accuracy of ionosonde in predicting the occurrence of EPBs above its location is approximately 0.80, and the accuracy decreases by 10% for forecasting EPB occurrence at longitudinal distances of 30 deg. The results of this study enhance our knowledge of the connection between the evening vertical plasma drift and the emergence of post-sunset EPBs by utilizing the data obtained from the ionosonde. In addition, the study offers an essential insight into the recommended coverage range of ionosonde for predicting EPB occurrence in the zonal direction, which can be utilized to strengthen the regional space weather services.