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The occurrence of plasma bubble and its relation to the vertical drift using ROCSAT-1/IPEI Data

In this paper, the plasma bubbles observations from ROCSAT-1 satellite between January 2000 and May 2004 with longitude limited in 90°E—150°E are used for studying the mechanism of ESF's production at low latitude. The statistical study indicates the occurrence of the plasma bubbles increasing with the solar activity. In the spring and autumn of high solar activity, about 50 percent days have the plasma bubble observed. The bubbles mainly occurred about $\pm 30^\circ$ magnetic latitude region, and mainly at the geomagnetic quiet condition, occasionally at storm time. The bubbles during a major-severe storm mainly happened after midnight. The vertical drift observation from ROCSAT-1 satellites indicates there is always a significant polarized eastward electric field associated with the plasma bubbles at pre-midnight. But after midnight the association is seldom happened. At geomagnetic disturbed period, the penetration of the eastern electric field can cause the plasma bubbles after midnight.