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Developing Equatorial Plasma Bubbles Observed by Multi-Instrument at Dawn

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Previous studies have shown that equatorial plasma bubbles (EPBs) usually occur after sunset, and they usually drift eastward. Observations from an all-sky imager and the Global Navigation Satellite Systems (GNSS) network in southern China showed a special EPB event. Observational results show that the EPBs appeared near dawn and continued to develop after sunrise. They disappeared about one hour after sunrise which the life time of those EPBs exceeds 3 hours. The result provided an evidence that the EPB could develop around sunrise in optical observation. Meanwhile, those observation showed that the EPBs drifted westward, which was different from the usually eastward drifts of EPBs. The simulation from TIE-GCM model suggest that the westward drift of EPBs should be related to the enhanced westward winds at storm time. Besides, increasing in the ionospheric F region peak height was also observed near sunrise. We suggest enhance upward vertical plasma drift during geomagnetic storm plays a major role in triggering the EPBs near sunrise.