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Observations of Plasma Depletions During Solar Maximum

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The continuous occurrence of plasma depletions on several nights observed from the low latitdue station Kavalur (12.56°N; 78.8°E), India during February-April 2002 are reported here. Out of the total forty nights of observations, depletions were present on 27 nights. We observed several cases of post-midnight generation of irregularities. On some nights depletions were present in the presunrise hours. Previous studies have shown that the probability of occurrence of post-midnight spread-F is minimum during solar maximum. We also observed the simultaneous appearance of plasma depletions in 630.0, 557.7 and 777.4 nm images. The mesospheric component of 557.7 nm emission dominates its F-region component. Thus, plasma depletions are not generally observed in 557.7 nm images. Various dynamical processes, coupled with the solar maximum effects can cause the F-region component to dominate the mesosperhic component. On most of the nights, depletions were seen in 557.7 nm images only towards the midnight or in the post-midnight hours. In the early morning hours the 777.4 nm images did not show any plasma depletions, while on many nights 630.0 and 557.7 nm images showed strong and intense plasma depletions.

Keywords: Ionospheic Irregularities; Equatorial Ionosphere; Airglow; Plasma Depletions.