



On the occurrence of equatorial plasma depletions: superposed epoch analysis during geomagnetic disturbed period

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During ROCSAT-1 life period of July 1999 to April 2004, 97 CME driven geomagnetic storms are sorted out to conduct a superposed epoch analysis on the occurrence of Equatorial Plasma Depletions (EPDs). Results show interesting storm time promotion and inhibition effects on the occurrence rate of EPDs regards to different epoch times and local times, which is also longitudinal dependent. Together with analysis on the equatorial ion vertical drift (V_z) and background ion density (N_i), disturbed electric field is inferred and positive ionospheric storm are witnessed for entire night. The disturbed V_z is found to serve as a main factor to control the occurrence of EPDs at postsunset (1800-2200 LT). However, for EPDs at local time sectors of midnight (2200-0200 LT) and predawn (0200-0600 LT), the influence from V_z is less evident. We suggest that the occurrence of EPDs after midnight should consider the developing progress from those EPDs which is initialized at earlier local time at lower altitude. In this sense, other factors like topside background plasma density, meridional neutral wind should supplementally influence the occurrence of the EPDs.