

Effects of solar wind variations on the long-duration penetration of interplanetary electric field to the low-latitude ionosphere during magnetic storms

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It is believe that the interplanetary electric field (IEF) can penetrate into the middle- or low- latitude ionosphere through the shielding process. It will cause significant redistribution of the global ionospheric electron density. Especially, long-duration penetration of interplanetary electric field is great responsible for long-duration ionospheric positive storms at low or middle in the daytime. However, for the penetration of IEF, the shielding efficiency is unsolved topic. In the paper, comparing the interplanetary electric field, solar wind pressure obtained from the Wind satellite, with the daytime enhanced eastward equatorial electrojet referred from ground-based magnetometer observations at low latitudes, we find that the relationship between the solar wind variations with penetration electric field at low latitudes. Not only the dawn-dusk component of IEF but also the solar wind pressure has strong effect on the penetration of interplanetary electric field into low-latitude ionosphere.