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Magnetospheric-Atmospheric Dynamo Coupling

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From the observational and simulation studies,we know that various kinds of magnetospheric forcing affect the ionospheric currents at middle-and-low latitude. Using the geomagnetic data acquired with 210 degrees magnetic observation network,we analized the geomagnetic variations in the daytime hemisphere for both geomagnetically quiet and disturbed conditions. All the variations are measured by the level of week variation in the nighttime sector on the quiet days and the so-called Sq variation are not subtracted from the variations on the disturbed days. By a comparative study of the distributions of the net electric field (electrostatic plus UxB) at middle-and-low latitudes of the quiet and disturbed conditions, we investigate the manner of magnetospheric-atmospheric dynamo coupling.

The large-scale counterclockwise and clockwise equivalent current in the middle-and-low latitude ionosphere , respectively , in the northern and southern hemisphere have been proposed to be caused mainly by the neutral wind motions dragging the ions (atmospheric dynamo) . While , in the polar ionosphere , large-scale field-aligned currents transmit almost always the electric field , momentum and poynting flux from the magnetosphere that are generated by the solar wind-magnetosphere interaction (magnetospheric dynamo). From the observational and simulation studies , we know that various kinds of magnetospheric forcing affect the ionospheric currents at middle-and-low latitude : momentum transfer from ion plasma convection to the neutral wind motion and joule heating in the auroral-zone currents as a energy budget . Using the geomagnetic data acquired with 210 degrees magnetic observation network , we analized the geomagnetic variations in the daytime hemisphere for both the prolonged period of geomagnetically quiet and disturbed conditions that were sampled in the solsticial and equinoxial seasons . All the variations are measured by the level of vanishingly week variation in the nighttime sector on the very quiet days and the so-called Sq variation are not subtracted from the variations on the disturbed days . By a comparative study of the distributions of the net electric field (electrostatic plus U (neutral wind velocity) x B) at middle-and-low latitudes of the quiet day and disturbed conditions , we investigate the manner of magnetospheric-atmospheric dynamo coupling .