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HIGH-ENERGY PARTICLE EFFECTS IN THE D-REGION DURING
AND AFTER GEOMAGNETIC STORMS

E. A. Lauter and C. -U. Wagner

Academy of Sciences of the G.D.R.
Central Institute of Solar-Terrestrial Physics
(Heinrich-Hertz-Institute)
DDR-1199 Berlin-Adlershof, G.D.R.

ABSTRACT

The precipitation of energetic particles from the magnetosphere produces a remarkable modification of the mid-latitude D-region structure during daytime and at dawn and dusk conditions. Beside the heavily fluctuating precipitation during the main storm phase there exists a more continuous input of high energy electrons into the mesosphere in the belt between $\phi = 50^\circ$ and the auroral zone up to ten days after the disturbance. The excessive D-region ionisation, the after-effect of geomagnetic storms, is caused at least partly by additional nitric oxide production. Especially the winter anomaly effects are amplified and prolonged by this effect. The source of this mid-latitude particle precipitation is thought to be situated in magnetospheric slot region processes.