

DEVELOPMENT OF SUBSTORM ENDING THE STEADY CONVECTION INTERVAL

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The Steady Magnetospheric Convection interval on November 24, 1981 was characterized by southward directed IMF during more than 10 hours and the moderate (400 nT in AE index) magnetic activity on the ground without the typical substorm signatures. This SMC interval ended with a substorm started at around 12.30 UT. To study the transition from the SMC to the substorm the ground-based magnetometer and all-sky camera data along with the data of the NOAA low-altitude and LANL geosynchronous satellites were used. The search for the growth phase signatures showed that prior to the substorm there were no such typical signatures as the increase of the convection in the polar cap, the equatorward movement of the polar cap boundary and other auroral zone boundaries, specific magnetic variations at mid-latitude stations. The geostationary satellites did not register either the increase in the magnetic field inclination or specific changes of the anisotropy of the particle distribution in the evening and night sectors, although these parameters exhibited very stretched magnetic field in these sectors during the whole SMC interval. Nevertheless some local increase in the eastward electrojet was detected 20 min before the expansion phase onset as well as a weak decreasing of the convection in the polar cap. Expansion phase of this substorm developed as a sequence of intensifications including the poleward leap. The first onset started in the evening sector slightly further poleward from the >30 keV electron trapped boundary and well equatorward of the poleward edge of the auroral particle precipitation. Despite the lack of the growth phase signatures we conclude that our findings are not in contradiction with the substorm growth phase concept. In fact the SMC provided the conditions in the tail similar to those for the end of a growth phase. The triggering of the expansion phase instability in the near-Earth plasma sheet could result from some external reason. What this reason could be we discuss basing on the above features preceding the expansion phase onset.