DAYSIDE HIGH LATITUDE MAGNETIC IMPULSIVE EVENTS: THEIR CHARACTERISTICS AND RELATION TO THE SUDDEN IMPULSES

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We considered the day side high latitude magnetic impulsive events occurred during the time interval 04-06 UT of December 17, 1990 using a number of ground-based data includin the observations of the middle and high latitude magnetic variations, riometer absorption, VLF emissions, and the EISCAT electron density.

It was shown that:

- at the ionospheric level in the morning sector the current system connected with the transient magnetic spikes consists of the vortex-like currents (isolated spike has double vortex current system). No signatures of such kind of current system has been found in the evening side.
- distance between vortices is about 1500 km on the day side - the vortices propagate tailward approximately along the corrected latitude 72 deg with the velocity of 0.10-0.16 deg/s (3.7-6.0 km/s) on the day side and about 0.23 deg/s (8.5 km/s) in the morning;
- the vortex-like currents are generated near the noon
- characteristic time of the decay of currents is about 15 min

Simultaneously with the vortex-like currents generation the precipitation of the energetic electrons was detected on the day side and in the morning (in sites of 4-6 hours MLT from the noon where the currents were generated); this precipitation band was detected at corrected latitudes 68-72 in the day side. At the same time the VLF emission enhancements were also detected in the morning.

These results along with the data of world-wide magnetic observations in the auroral zone and in the middle latitudes strongly confirm the relation of the specific currents appearing near the noon to the sudden impulses which are usually (and in our case, as it is evidenced from the data obtained by the IMP-8 satellite situated in the solar wind) connected with solar wind inhomogeneities.