CMEs are generally recognized as a crucial link between activity at the Sun and its propagation through the heliosphere to the Earth, with impact on the geomagnetic activity. As the CMES are most frequently associated with solar energetic events, we have carried out a systematic study of the relation between solar energetic events and their response in geomagnetic activity. Our attention was concentrated on X-ray events associated with solar energetic events, we have carried out a systematic study of the relation between solar energetic events and their response in geomagnetic activity. Our attention was concentrated on X-ray events (XRA) in combination with sweep frequency radio bursts (RSP) of type II (shock waves propagating outwards), type IV (moving plasmoids or expanding bottles) and type CMT (broadband, long-lived, dekametric continuum). According to our previous results (Bochniček et al.: Geoeffectiveness of irregular events versus their location on the solar disc, EGU General Assembly, 2005, EGU05-A-04482), RSP CTM is a weak precursor of geomagnetic activity and was not included in the recent analysis. Data on irregular events were extracted from daily reports issued by NOAA. Space Environment Center.

Enhancement of solar energetic proton (SEP) flux is often treated as another precursor of geomagnetic disturbances. In accordance with Gleisner and Watermann (Solar energetic particle flux as discriminator for halo CME’s generating magnetic storm, IAGA scientific Assembly 2005, IAGA2005-A-00577) the flux on level >10 MeV was used. The flux P is considered enhanced if log(P/P0) > 0.7, where P0 denotes the previous quiet level.

The disturbances of geomagnetic field are classified by three levels:
1 - Low – at least one value Kp=5 and another two values Kp>4
2 - Medium – at least three values Kp=5
3 - Strong – at least three values Kp>6

The highest geoeffectiveness was demonstrated by X-ray flares (XRA) associated with sweep frequency radio bursts (RSP) of type II (shock waves propagating outwards) and IV (moving plasmoids or expanding bottles). The geoeffectiveness was decreasing from XRA class X to class M. Vast majority of geoeffective energetic events occurs in the region (30°E - 30°W; 30°N - 30°S).

The occurrence of SEP flux enhancement for RSP II & IV is closely related to the class of XRA (highest for class X and lowest for class B). The substantial information is thus included already in the class of XRA and the SEP flux behavior has just a subsidiary role.

The geoeffectiveness of single RSP II or RSP IV is much lower and the relation to SEP flux enhancement is rather spurious.