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Spatial distribution of the magnetic disturbances at European midlatitudes during substorms: case study

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This work is aimed to study the spatial distribution of the magnetic field components variations during substorms. In this purpose, two isolated substorms, the substorm on 22 March 2013 at ~23:12 UT and the one on 14 January 2016, with central meridian over Europe have been chosen. Magnetic field data from INTERMAGNET, SuperMAG and IMAGE databases have been used. The X and Y variations due to the substorms were computed for 50 stations based on the developed programs. Maps of the spatial distribution of the magnetic variations have been created and some characteristics as the line of sign conversion latitude, the central meridian, the longitudinal and latitudinal extent of the positive bays and the latitudinal and longitudinal dependence of the variations at the time of the midlatitude positive bay maximum at Panagjurishte (PAG) and some other basic moments of the substorm development have been estimated. The midlatitude local time profiles for these events have been constructed. The European midlatitude positive bay (MPB) index has been computed.

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