

MID-LATITUDE AURORAS DURING GEOMAGNETIC STORMS FROM DATA BY NHC OPTICAL INSTRUMENTS AND CITIZEN SCIENTISTS

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In this paper, effects of the geomagnetic storm on December 1, 2023 after M9.82 class solar flare are considered. Mid-latitude auroras (MLA) were observed with all-sky cameras NHC of ISTP SB RAS and photos of astronomy enthusiasts from IRAO. In all-sky camera images, MLA was observed from 10.45 to 23.45 UT during the main phase of the storm. In addition, a structure corresponding to SAR (stable aurora red) arc was observed in the airglow.

Images from citizen scientists and all-sky cameras were processed and projected onto the Earth's surface using geo-referencing techniques. Next, for a set of altitudes, the image projections were compared using the stereoscopy method and the altitude of coincidence of aurora's certain area was determined. Thus, it was determined that for images with a spaced base, the coincidence of the same "columns" of airglow is observed for an altitude of about 500 km.

A joint analysis of the resulting images showed that digital camera data from amateur astronomers is sufficiently informative to study events occurring in the atmosphere at different altitudes. Further involvement of more amateur photographers will allow the use of a greater number of spatially separated observation points, and accordingly improve the accuracy of the resulting MLA characteristics.

Images of mid-latitude auroras were obtained with the help of the Irkutsk Regional Astronomical Society and astronomy enthusiasts.

Experimental data were obtained using the equipment of the Angara Shared Equipment Center (ISTP SB RAS) <http://ckp-angara.iszf.irk.ru/>.

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