SUPERSTORM OF SEPTEMBER 2-3, 1859 ACCORDING TO THE GEOMAGNETIC DATA OF THE RUSSIAN NETWORK

M. I. Tyasto 1, N. G. Ptitsyna 1, I. S. VESELOVSKY 2, 3, and O. S. Yakovchouk 3

1 St. Petersburg Filial of Institute of Terrestrial Magnetism, Ionosphere, and Radiowave Propagation, Russian Academy of Sciences, Muchnoi per. 2, St. Petersburg, 191023 Russia
2 Skobeltsyn Institute of Nuclear Physics, Moscow State University, Moscow, 119992 Russia
3 Space Research Institute, Russian Academy of Sciences, Profsoyuznaya ul. 84/32, Moscow, 117997 Russia

The Russian network of geomagnetic observatories was founded in 1830, when regular measurements in Ekaterinburg, Barnaul, Nerchinsk, Tiflis, and Sitka were added to the magnetic measurements that were already performed in St. Petersburg since 1829. A retrospective analysis of the Russian magnetic observations of the Carrington storm that occurred on September 2–3, 1859, has been performed. We used the hourly observations of the geomagnetic field *H* component, which were conducted from August 31 to September 5, 1859, at St. Petersburg, Ekaterinburg, Barnaul, and Nerchinsk, and the 5-min data for St. Petersburg and Ekaterinburg. The conclusion has been made that this storm was caused by the series of three consecutive eruptive solar flares during ~40 h. The value and direction of a magnetic field disturbance, Registered during the maximum of the geomagnetic storm of September 2, unambiguously indicate that all Russian stations were in the auroral oval zone, which was strongly expanded southward from its average position. The disturbance dependence on the station longitude − the absence of magnetometer pinning only in one station in Nerchinsk − is interpreted as the possible manifestation of a strong asymmetry in the effective contour of the current system, which was connected to the heliosphere and covered the disturbed magnetosphere and ionosphere during the short period that lasted only 1–3 h.

Magnetic storms, network of observatories

I. S. Veselovsky, Institute of Nuclear Physics, Moscow State University, 119992, Moscow, Russia, tel. +7 495 939 1298, fax. +7 495 939 3553, e-mail: veselov@dec1.sinp.msu.ru