Atmospheric electric field effects due to the April 2001 solar proton event

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The April 15, 2001 solar flare is one of the most powerful events recorded over the last 25 years. The flare was classified as an X14 on the scale of solar flare strengths and followed by a powerful solar proton event of Ground Level Enhancement (GLE) type. Of course, such event must be resulted in a large disturbance of global atmospheric electric circuit. In this paper the measurements of vertical electric field and atmospheric conductivity made by a high-latitude computer-aided complex on 15 April 2001 in the auroral zone (Apatity, geomagnetic latitude: 63.8) are presented. A significant disturbance in atmospheric electric field has been observed at the time of solar flare. It is interesting to note that the beginning of electric field perturbation has been detected a some time (about half an hour) ahead of the X-ray burst (13.50 UT) and GLE onset (14.05 UT, according to the data of Apatity neutron monitor). Measurements of atmospheric electric field at St.-Petersburg (geomagnetic latitude: 56.1) showed a similar disturbance at the same time. This permits us to consider experimental effect observed as a global one. A possible explanation of experimental results based on the method of "labeling" the corresponding magnetic field line at the earth surface with its coronal connection longitude is discussed.