

Plasmasphere state effect on the positive phase of the ionospheric storm

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The method of mathematical modeling has been applied to investigating the positive ionospheric storm formation dependence on the initial plasmaspheric state. The self-consistent global model of the upper atmosphere of the Earth (UAM)[1] was used in this investigation. The calculation was performed for the case of the geomagnetic storm took place on August 15, 1993. The locations of the auroral precipitation and field-aligned current regions were set in agreement with the DMSP satellite observation data. Energy and intensity of precipitating electron flux were taken as functions of the geomagnetic activity. A numerical experiment was performed to demonstrate that the storm induced neutral wind is a main factor of the positive phase of the ionospheric storm but its effect depends strongly on the initial plasmasphere state namely on the degree of plasmaspheric tube filling.

Reference

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