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IMF By effects in the plasma flow at the polar cap boundary

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We used the dataset obtained from the EISCAT Svalbard Radar during 2000-2008 to study statistically the ionospheric convection as related to IMF By conditions, separately for northward and southward IMF. The effects of IMF By are manifested in the intensity and direction of the East-West component of ionospheric flow. The most significant effects are observed near noon and also in the early morning around 03 MLT, whereas in the evening (at 18 MLT) the effect is essentially less prominent. The other feature is an anti-sunward flow across the polar cap, which shows increasing with the magnitude of IMF By. Quantitative characteristics of the IMF By effects are presented and explained in frame of the magnetospheric electric fields generated due to the solar wind, with taking into account position of the open-closed boundary for different IMF conditions.
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