Influence of interplanetary magnetic field on auroral activity

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Aurora is a typical phenomenon of the magnetosphere. But systematic study of the dependence of auroral activity as a function of the interplanetary magnetic field (IMF) orientation and the season seems useful. The morphology of aurora has been studied depending on IMF. We used average auroral polar flux as index of the auroral activity. Information about IMF was obtained from IMP8. It's known that IMF affects on the auroral brightness, especially Bz component.

We studied the behaviour of the auroral activity as function of the azimutal component of IMF induction.

Auroral activity increases when $Bz<0$ and $By<0$. The power flux also rises with increase of IMF magnitude. The auroral brightness depends on season. Aurora has strong activity during equinox and smaller activity during the solstice.

We also obtained the behaviour of the auroral and geomagnetic activity as function of the IMF orientation in heliographic inertial system (HGI). The obtained asymmetry in activity distribution can particularly explain seasonal variation of aurora.