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How IMF B_x affects the two polar hemispheres differently

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From studying the aurora in both hemispheres simultaneously, mechanisms responsible for producing asymmetric aurora have earlier been identified. One such mechanism believed to be responsible for large-scale asymmetries on auroral brightness between the hemispheres is the solar wind dynamo ($\mathbf{E} \cdot \mathbf{j} < 0$). In the presence of a significant B_x-component in the interplanetary magnetic field during B_z negative, the solar wind dynamo is suggested to be more prominent in one hemisphere compared to the other. By utilizing the large IMAGE WIC database of global imaging of the aurora from the Northern Hemisphere, we derive patterns of auroral intensities for a) when the efficiency of this mechanism is believed to be important compared to other mechanisms, and b) during similar conditions when the efficiency of the solar wind dynamo is believed to be important in the opposite (southern) hemisphere. First results indicate a distinct difference in intensity between the two cases. In order to investigate the expected similar effect in the Southern Hemisphere, a similar analysis on the much smaller dataset from the Polar VIS Earth camera will be conducted. In the Southern Hemisphere we expect to see the same IMF B_x intensity dependence but for opposite sign of IMF B_x. Also, MHD simulations of the magnetosphere system might be utilized to further investigate any asymmetric flow speeds between the northern and southern magnetosheaths expected from the suggested asymmetric dynamo action.