

## The location of the initial brightening of auroral substorm in the auroral oval (Part II)

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The initial brightening (IB) is the first, localized auroral emission that is followed by auroral intensification in area and brightness and eventually developed to an auroral bulge. The aim of this study is to reply to one of the outstanding questions to understand the substorm processes, where the IB happens to occur in the magnetosphere. We have analyzed isolated substorm events observed with Polar and determine the relative location of IBs to the higher and lower boundaries of individual auroral ovals. Furthermore, we found quasi-simultaneous observations between Polar and DMSP, which enables us to infer the location of an IB in the magnetosphere in terms of BPS/CPS. The results are summarized as below.

1) Statistically, IBs occur around the middle of the auroral oval, neither near the equatorward nor the poleward boundary of the auroral oval.

2) With a decrease of IMF Bz, the IBs become to be located nearer to the equatorward boundary of the auroral oval.

3) One quasi-simultaneous observations between Polar and DMSP has shown that the IB of this substorm event occurs in CPS and downward field-aligned region.