



Auroral responses to the large solar wind dynamic pressure pulses under the different IMF Bz orientation: case studies

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Large and fast solar wind dynamic pressure pulses as well as southward orientation of the interplanetary magnetic field (IMF) can lead to important large-scale disturbances of the magnetosphere-ionosphere system. The effects from the solar pressure increase will be extensive if southward IMF accompanied the solar wind dynamic pressure enhancement. We compared auroral responses to the large and fast solar wind dynamic pressure pulses accompanied by northward and southward IMF orientation. We found that growth of the solar wind pressure during northward IMF leads to an enhancement of the luminosity intensity at the dayside of auroral oval. Otherwise increase in solar wind pressure during weak southward IMF can serve as a trigger for the pseudo-breakup onset. Case studies have shown that large solar wind pressure pulses accompanied by strongly southward IMF and arrived during substorm growth phase triggered substorm onset. Pressure pulse under the southward IMF condition arrived after substorm onset produced strong dayside auroral activation, which merged together with substorm current wedge, resulted in the further intensification of substorm.