Signature of Omega band auroras observes by THEMIS

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We examined omega band auroras observed with the THEMIS ground based all-sky imagers. Using 8 years data from 2007 we found a large number of events (~ 150) that showed almost whole processes of the generation of omega band aurora from the initial growth phase to the declining phase through expansion phase. The interesting features for the growth of omega band aurora are as follows; the omega band aurora grew from a faint seed, not via distortion of pre-existing east-west band aurora. The aurora did not show any shear motion during the growth of auroral activity. The omega band auroras occur in the post midnight to morning sector auroral zone during the recovery phase of magnetospheric substorms. They drifted eastward with a speed of a few hundred meter/sec. Ps6 magnetic pulsations with period of ~ 10-30 minutes were observed in association with the occurrence of omega band aurora, most apparent for the Z component. A black hole-like dark aurora was found during growth and expansion phase just at the eastside of omega band aurora. Omega band aurora generally consists with intense pulsating aurora.
In this study we examine generation and growth signature of optical omega band auroras with referring THEMIS spacecraft, magnetometers, SuperDARN, IMF and Dst data.

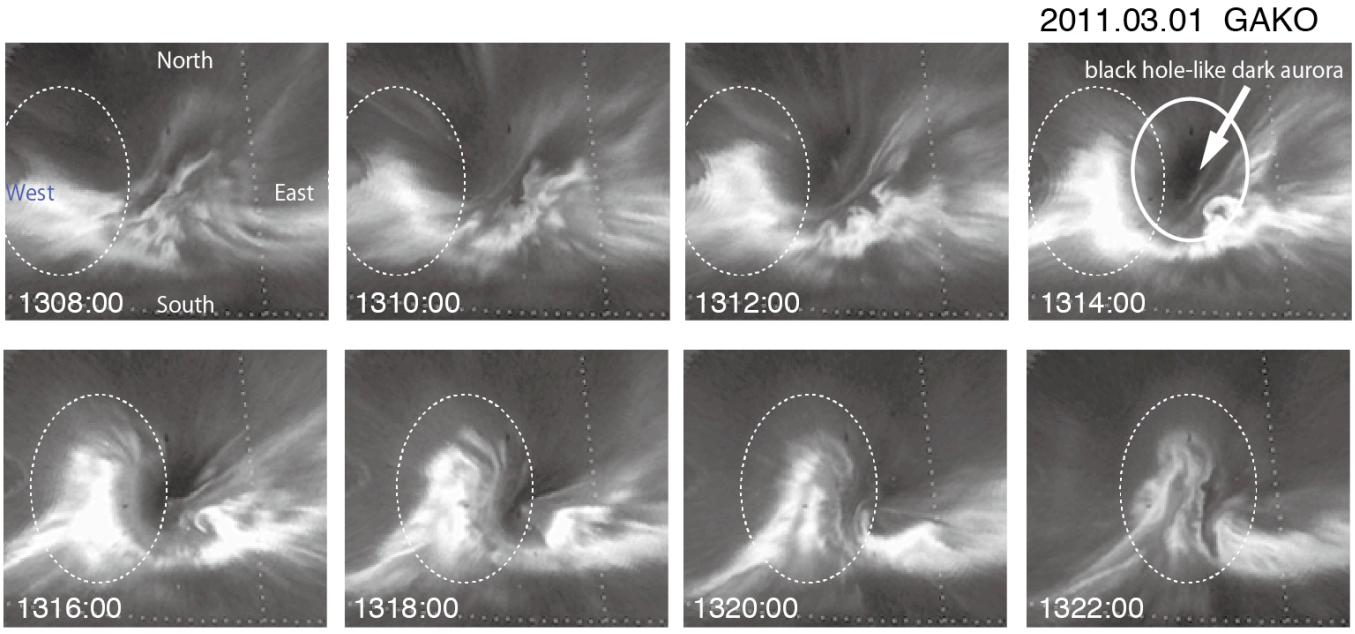

Figure 1. Auroral images taken every 2 min during a growth period to expansion period of torch-like structure omega band aurora. Auroral images were enlarged from the originals.