# IONOSPHERIC CONTROL OF AURORAL OCCURRENCE

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Analogous to color CRTs, the aurora is a visual manifestation of the bombardment of atomic and molecular neutrals in the upper atmosphere by magnetic field-guided energetic charged particles (mainly electrons) from above. Based on this framework, the magnetosphere is the source of energetic particles, whereas the ionosphere is merely a passive "illuminated target." However, it is not clear if the magnetosphere is acting along in the energization of the particles because the energization occurs at the magnetosphere-ionosphere interface. The discovery of suppression of auroral acceleration events in sunlight [Newell et al., 1996] provides a new interpretation – the ionosphere is also playing an active role in the auroral production. The auroral sunlight effect is often attributed to an ionospheric feedback mechanism in which the background ionospheric conductance determines if an acceleration is required. However, a relationship between the background ionospheric conductance and the aurora has not been identified. In this presentation, we provide solid evidence to confirm that the ionospheric conductance plays a key role in modulating auroral intensity to a degree that may surpass its source's manipulation. This study is based on 56,675 Earth's disk FUV images of the polar regions acquired by TIMED/GUVI between February 2002 and November 2007. It is found that the occurrence rate of visible aurora reduces when the polar ionosphere is exposed to sunlight. Furthermore, the energy flux carried by precipitating electrons shows anti-correlation with the ionospheric background conductance. Suppression of the auroral energy flux is also found to continue in twilight until the ionosphere is totally in darkness – a strong evidence of ionospheric manipulation because the magnetospheric sunlight condition does not change. The present study suggests a new mechanism that governs our space disturbances, in addition to the more familiar magnetic field reconnection.

Aurora, ionospheric conductance

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