A04-O11

AN EXTENSIVE SURVEY OF THE OPTICAL STRUCTURES OF THE DAYSIDE DIFFUSE AURORA

Desheng Han *(Polar Research Institute of China, China)*
Xiangcai Chen *(Geophysics Department, University Center in Svalbard, Norway)*
Qi Qiu *(Polar Research Institute of China, China)*
Hongqiao Hu *(Polar Research Institute of China, China)*
Huigen Yang *(Polar Research Institute of China, China)*

handesheng@pric.org.cn

Chinese Yellow River Station (YRS), at Ny-Alesund, Svalbard is one of the few stations that can make longtime optical auroral observation at the cusp latitude in the dayside during the boreal winter season on the Earth. Since November 2003, an optical observation system consisting of three identical all-sky imagers supplied with the narrow band filters centered at 427.8, 557.5 and 630.0nm, has been installed at YRS, and the continuous observations providing us with an unprecedented opportunity to investigate some new properties of dayside aurora. Diffuse auroras are normally observed at equatorward of the aurora latitude from local mid-night to the morning. However, by using 7-year continuous observations at YRS, we found that the diffuse auroras are very frequently observed on the dayside even at the high latitude near the cusp. Based on the morphological or dynamic properties, we classified the dayside diffuse auroras into four categories. They are (1) Veiling Diffuse Aurora, which is stable and has no obvious morphological structure or clear boundaries, looks like a veil covering the field of view of the camera, (2) Diffuse auroral Patch, which shows in patchy structure and usually is drifting or pulsating; (3) Diffuse auroral Stripes, which often show as multiple parallel stripes with drifting or pulsating, and can be orientated in any direction, (4) Pulsating Aurora, which is structured diffuse aurora and with clear pulsating property. We statistical studied how the occurrence of the four types of dayside diffuse auroras depends on the local time, magnetic activity, and solar wind conditions. We found that the occurrence of each type of dayside diffuse aurora shows a unimodal distribution with magnetic local time and their peaks are mostly appeared near the magnetic local noon. We also noted that ~92.2% of the dayside diffuse auroras is observed under low magnetic activity, i.e., $Kp \leq 3$, and the dayside diffuse auroras prefer to be observed under IMF $By<0$ and $Bz>0$. Although previous studies suggested that the dayside diffuse aurora should be caused by wave scattering of relatively high-energy magnetospheric electrons that drift from the nightside after a substorm injection, we believe that our observational results on the dayside diffuse aurora will provide new clues for fully understanding the generation mechanisms to the diffuse aurora.