

Sprites and elves observation in Arctic region

Yukihiro Takahashi[1], Satonori Nozawa[2], Kazuhiro Adachi[3], Hiroshi Fukunishi[4], Ryouichi Fujii[2]

[1] Dept. Geophysics, Tohoku University, [2] STEL, Nagoya Univ, [3] Particle and Astrophysical Sci., Nagoya Univ, [4] Department of Geophysics, Tohoku Univ.

<http://pat.geophys.tohoku.ac.jp/~yukihiro/>

It was found in 1998 that sprites and elves, optical phenomena in the middle and upper atmosphere induced by strong cloud to ground discharge, are occurring not only in summer but also in the winter season. Tohoku University imaged over 20 sprites in the west coast of Japan centered at Hokuriku district, where the climate condition and lightning activity in winter is very similar to those in northern Scandinavia. This fact implies the occurrence of these optical phenomena in the polar region during Arctic night, suggesting the interaction between aurora and lightning phenomena. To discover sprites and elves in the Arctic circle, we plan to install optical instruments in the next winter. We also make use of EISCAT radar to examine the effect of lightning on the polar ionosphere and magnetosphere.