

S002-P08

ポスター 1 : 11/24 PM1/PM2 (13:15-18:15)

#細川 敬祐<sup>1)</sup>, ジャッキーリー ピーター<sup>2)</sup>, 尾花 由紀<sup>3)</sup>

(<sup>1)</sup> 電通大, (<sup>2)</sup> ダニーデン天文協会, (<sup>3)</sup> 九州大学 国際宇宙惑星環境研究センター

## Southern hemispheric aurora during the Mother's day storm: a color all-sky camera observation in New Zealand

#Keisuke Hosokawa<sup>1)</sup>, Peter Jaquiere<sup>2)</sup>, Yuki Obana<sup>3)</sup>

(<sup>1)</sup>University of Electro-Communications, (<sup>2)</sup>Dunedin Astronomical Society, (<sup>3)</sup>International Research Center for Space and Planetary Environmental Science, Kyushu University

We have been operating a small color all-sky camera at Middlemarch ( $-45.6^{\circ}$  S,  $170.1^{\circ}$  E, MLAT =  $-52.75^{\circ}$ , L = 2.77) in the South Island of New Zealand. This optical system consists of a small color CCD camera (WAT-221S2) from Watec Co. Ltd., Japan, paired with a fish-eye lens (YV2.2X1.4A-SA2, Fujinon Co. Ltd.). Color images are captured every minute with an exposure time of 4.3 seconds, using a USB video encoder (PCA-DAV2), and saved as JPEG files at a resolution of  $640 \times 480$  pixels. The CCD camera is controlled by a Raspberry Pi3 equipped with a GPS receiver and operates when the Sun is well below the horizon. The entire system is powered by solar cells and batteries, shared with the fluxgate magnetometer system operative at the same observatory. The primary objective of this observation is to detect proton aurorae at the low-latitude edge of the sub-auroral region, a phenomenon associated with EMIC waves in the magnetosphere. Since the start of the observations in 2018, however, signatures of aurora have not yet captured near the central part (zenith) of the field-of-view.

On the night of May 11, 2024, i.e., the second local night during the Mother's day magnetic storm, the camera was operational for approximately 7.5 hours, from 06:32 to 14:00 UT. When the camera began recording, a less structured magenta aurora already covered nearly the entire sky. This phase of magenta aurora persisted for about 30 minutes, until around 07:10 UT. Subsequently, the camera observed multiple instances of image saturation caused by intense auroral displays, likely indicating auroral breakups in the lower sub-auroral region. Concurrently, the fluxgate magnetometer observed significant fluctuations, with amplitudes estimated to be at least 500 nT. The actual fluctuations likely exceeded this value, but they were beyond the detectable range of the instrument. Several sharp decreases and increases were detected in the local magnetic north component, which likely corresponded to the explosive brightening of the aurora captured in the optical data.

In this presentation, we will first provide an overview of the morphological features of this storm time aurora by showing the color keogram, with particular emphasis on the transition of the color of aurora. Additionally, we will present space-based optical data from the DMSP/SSUSI instrument, comparing these with the ground-based observations from New Zealand. Finally, we will discuss the factors driving the change of the color of aurora from magenta to a mix of green and red, in close relation to the development of the magnetic storm.