2023年9月7-16日　カナダ・アサバスカ観測ノート　　塩川和夫（教授）、Liwei Chen (D2), 椙村怜(M2)

・アサバスカ大学構内のAUGO-IサイトにNikon D610カラー全天カメラ（C002）とZWO ASO294MM Pro全天カメラ（Z006, 630nmフィルタ)を設置して、約25km南西に離れた既存のAUGO-IIサイトのOMTIカメラ、Nikon D610カラー全天カメラ（C001）と組み合わせたオーロラの2点同時観測を実施(9/9-14)。Isolated proton aurora/SAR arc (9/14)の２点観測に成功。今後の解析によるオーロラの高度決定が期待される。
・Z006は観測終了後持ち帰り。C002はAUGO-Iで自動観測を継続する。
・AUGO-IIのリオメータのプリアンプのペリカンボックスが動物によって壊されて、中のプリアンプが引き出されてケーブルが切られていた。日本に持ち帰って修理する。但し2023年6月21日にリオメータの出力が出なくなった後、現地のRajuとMartinがリオメータアンテナを見てくれた時には、プリアンプボックスは問題なかった。つまり信号が途絶えた原因は別にあり、その後、動物によってプリアンプボックスが開けられてしまったようだ。リオメータから10m離れた第１中継ボックスのところでもケーブルが切られていたので、それが最初の信号途絶の原因と思われる。

September 7-16, 2023, Athabasca, Canada Observation Notes

Kazuo Shiokawa (Prof.), Liwei Chen (D2), Rei Sugimura (M2)

- We installed a Nikon D610 color all-sky camera (C002) and a ZWO ASO294MM Pro all-sky camera (Z006 with a 630nm filter) at the AUGO-I site on the Athabasca University campus, and combined them with the existing OMTI camera and a Nikon D610 color all-sky camera (C001) at the AUGO-II site for triangulation measurements of aurora. Isolated proton auroras and a SAR arc were observed by these cameras on September 14, 2023.
- The Z006 camera will be taken back to Japan after the observation, while C002 will continue automatic observation at AUGO-I. Active pulsating aurora (Sept.13) and isolated proton auroras, SAR arc (Sept.14) were observed.
- The pelican box of the riometer preamplifier at AUGO-II was broken by an animal, and the preamplifier inside was pulled out and the cable was cut. It will be brought back to Japan for repair. However, after the loss of Riometer output on June 21, 2023, when the local people looked at the Riometer antenna, the preamplifier box was fine. So, it seems that there was another cause of the loss of riometer signal from June 21, and that the preamplifier box was then opened by an animal. Another cable cut was found at the cable relay box about 10m from the riometer antenna. This would be the cause of the signal loss.

Auroral Observation Notes

- Sept.8 night: arrival at the AUGO-II site from Japan at 20:30 LT on Sept.7 (02:30 UT on Sept.8). No triangulation measurements. Induction magnetometer PC was restarted. Tilting photometer PC was restarted and PC clock was corrected manually (NTP time correction by Sakura watch does not work). VLF and OMTI observations are working well.
- Sept.9: Field inspection at AUGO-II. Riometer was found to be broken. A Martin's MT sensor was also broken (cable cut). VLF antenna looks fine.
- Installation of C002 (Nikon) and Z006 (ZWO) at AUGO-I and triangulation measurements started from 0330UT. The observation is at 0330-1140 UT every night during this campaign.
- Z006 takes 630-nm images with a 30s exposure time and a 40s shot time (10s for data transfer). OMTI takes 630-nm images every 2 minutes from 03:30:59, 03:32:59, 03:34:59, ···. Thus, Z006 starts from 03:30:59UT and take 630nm images every 40s to obtain exactly simultaneous images.
- Both C001 and C002 Nikon color cameras have an exposure time of 30 second and a 1-min cadence.
- Sept.9 night: Some active aurora near the northern horizon after 09:00 UT. Auroral photos are taken at 09:08-10:06 UT by Nikon D40 (fish-eye, exposure: 20s) and Canon G9X (exposure 10s) cameras.
- Sept.10 night: Mostly clear sky over night but geomagnetic activity is very quiet. Weak aurora briefly appears only at the norther horizon.
- Sept.11: Backup battery (CR2302) of PCs for EMCCD was replaced. EMCCD camera observation has been restarted.
- Sept.11 night: Mostly clear sky over night but geomagnetic activity is very quiet. No aurora.

Auroral Observation Notes (continued)

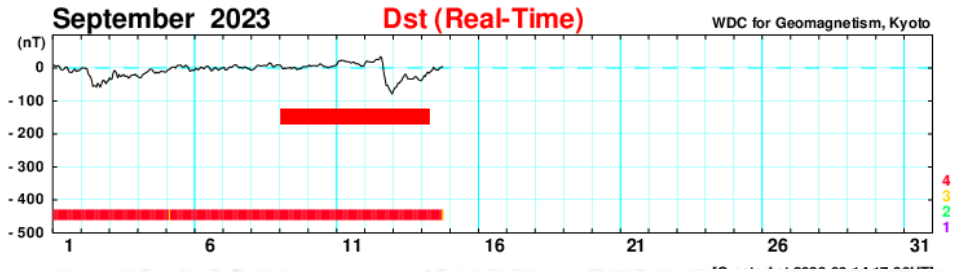
- Sept.12: Backup batteries (CR2302) of PCs for induction magnetometer and OMTI camera were replaced. Automatic clock correction of the PC of the tilting photometer (tilt3) was restarted. This error was caused by a wrong gateway setup.
- Sept.12 night: Mostly clear sky over night but geomagnetic activity is very quiet. No aurora. A small geomagnetic storm started at ~16UT after the sunrise.
- Sept.13: We found that the automatic correction of VLF PC clock was not working since May 23, 09:39 UT, 2023. VLF PC clock was different from the correct time for several tens seconds. The clock collection was restarted
- Sept.13 night: Hazy by smoke of forest fire, but some clear sky moments. Active pulsating aurora in the northern sky. Auroral photos are taken at 06:07-06:59 UT by Nikon D40 (fish-eye, exposure: 20s). Kazuo was fully packed by faculty meeting telecons with Japan throughout the night.
- Sept.14: Further check of the riometer site. Another cable cut by animals was found at the first cable relay box at ~10 m from the riometer antenna. We confirm that the 12V DC power is available up to this relay box.
- Sept.14 night: Mostly clear sky. Multiple events of isolated proton auroras in the southern sky. Active SAR arc at zenith with developing auroral activity in the north. Auroral photos are taken at 04:16-05:43 UT (isolated proton aurora) and at 0808-0838UT (SAR arc and active aurora) by Nikon D40 (fish-eye, exposure: 20s) and Canon G9X (exposure 10s)
- Sept.15: The ZWO camera Z006 was removed from AUGO-I and taken back to Japan. C002 continues automatic observation at AUGO-I for triangulation of color auroras.

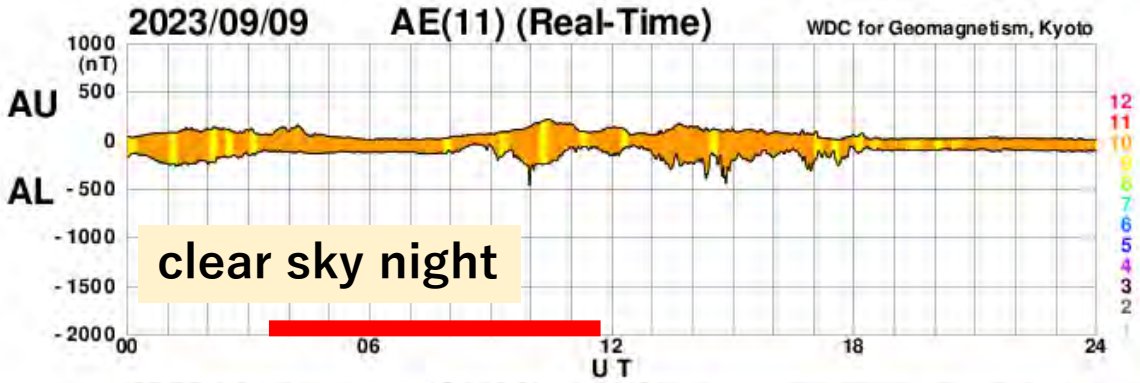
REAL TIME SOLAR WIND

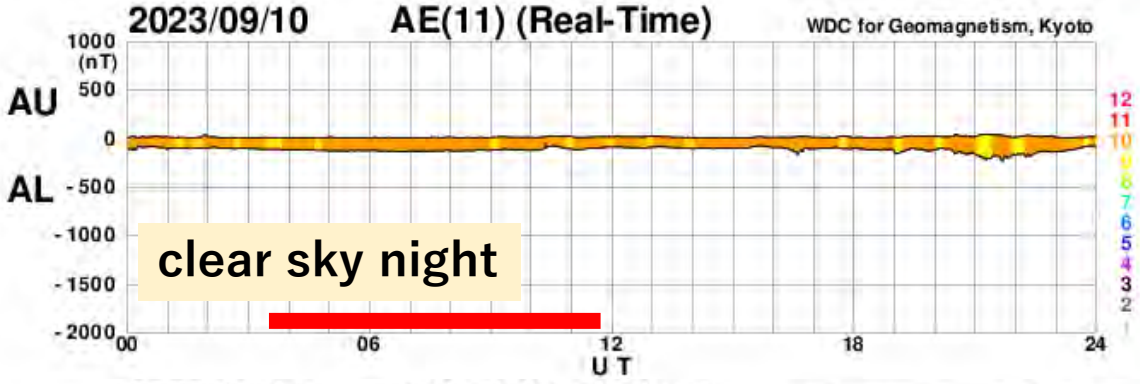
https://www.swpc.noaa.gov/products/real-time-solar-wind

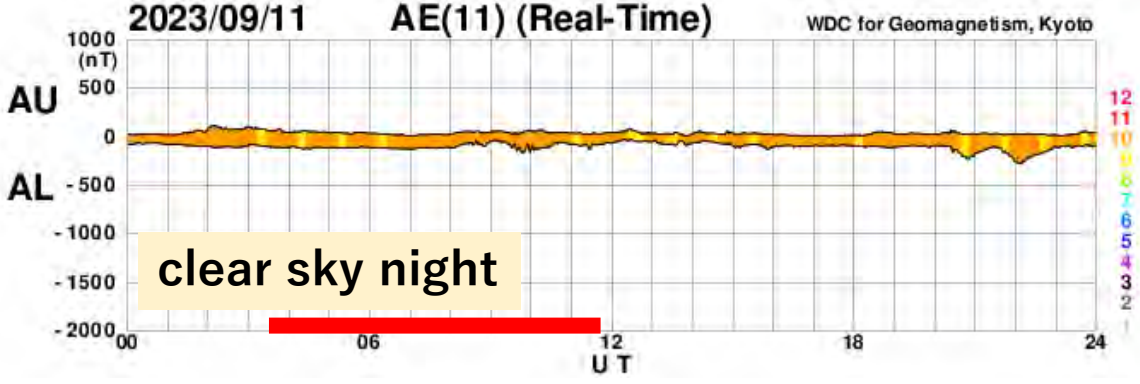
https://wdc.kugi.kyoto-u.ac.jp/dst_realtime/presentmonth/index.html

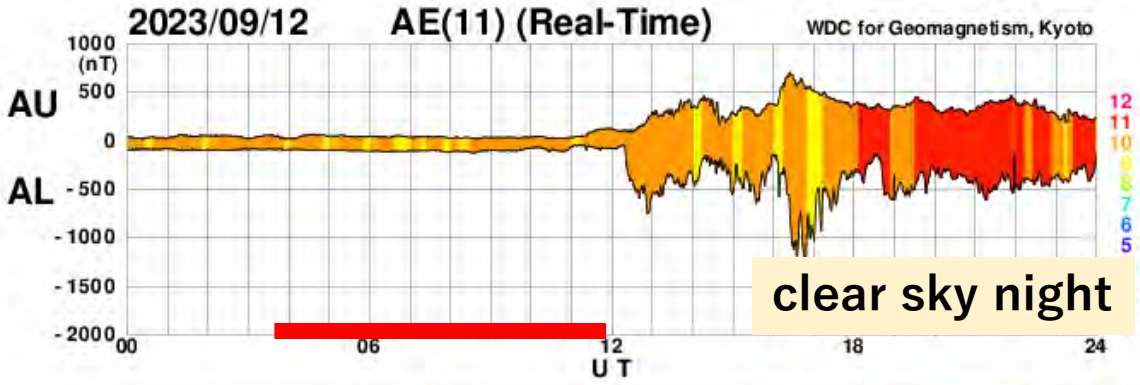
https://wdc.kugi.kyoto-u.ac.jp/ae_realtime/202309/index_20230914.html

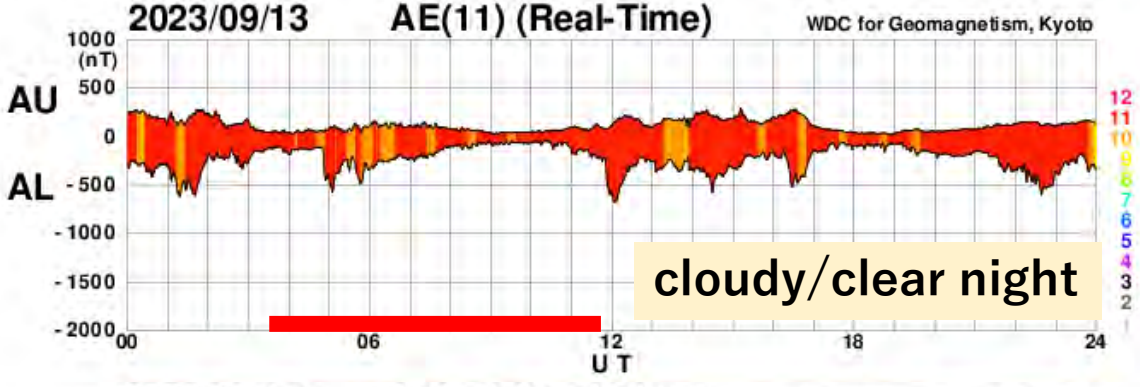


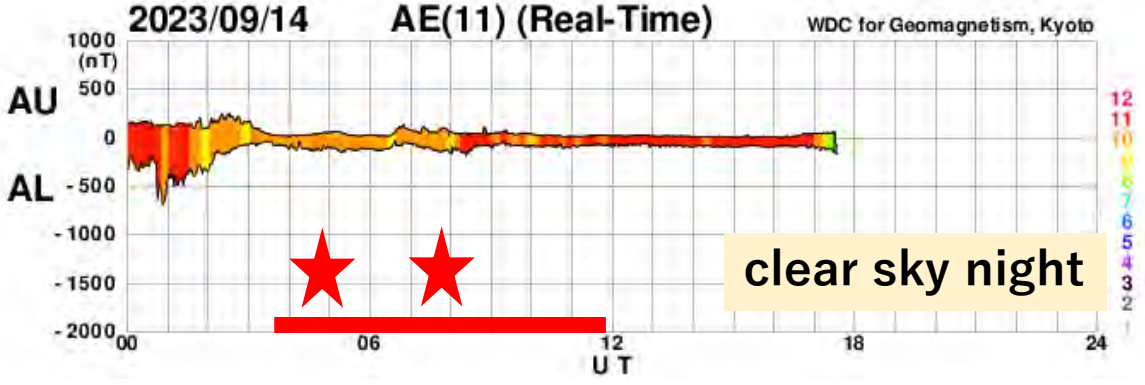




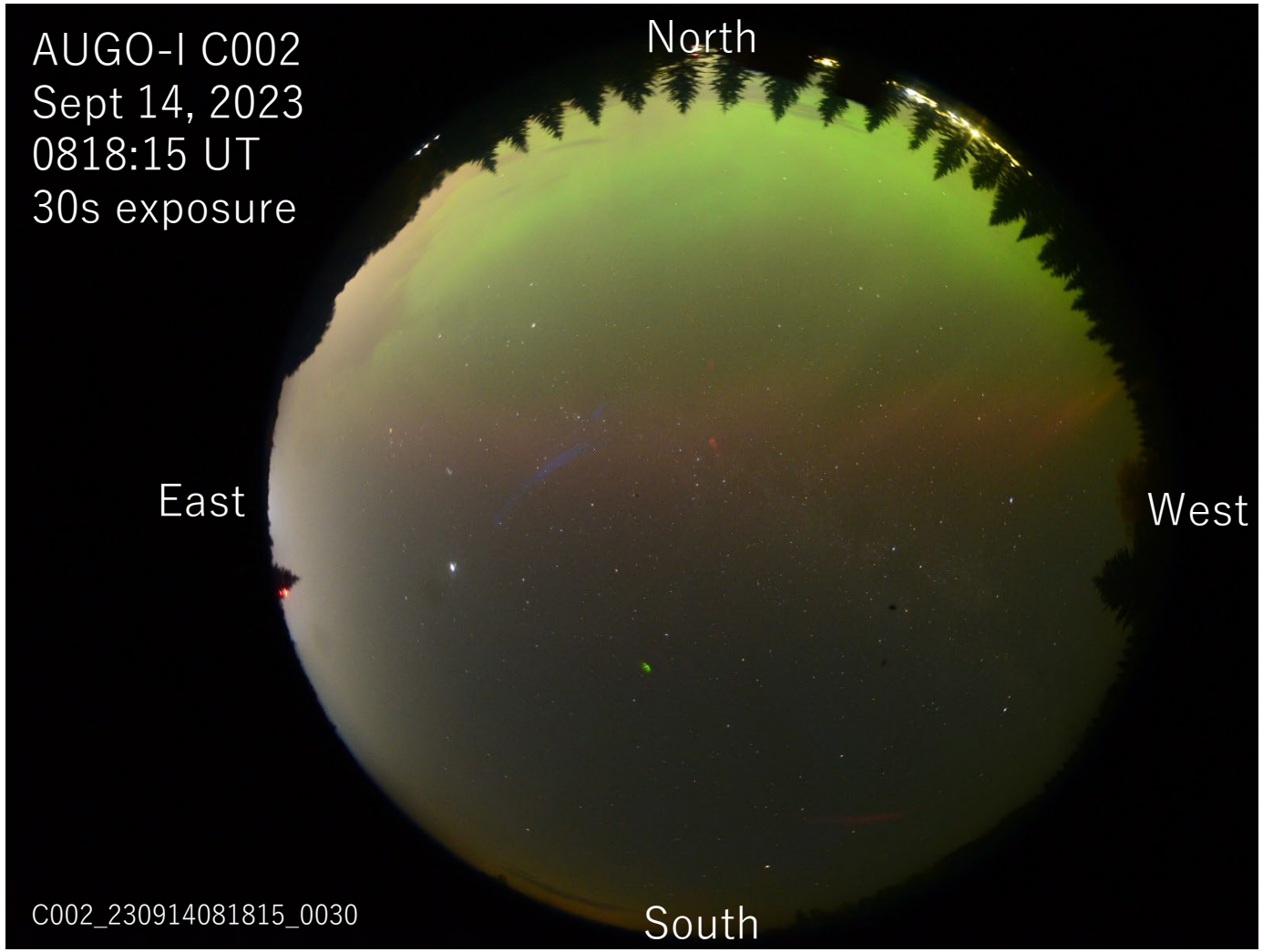


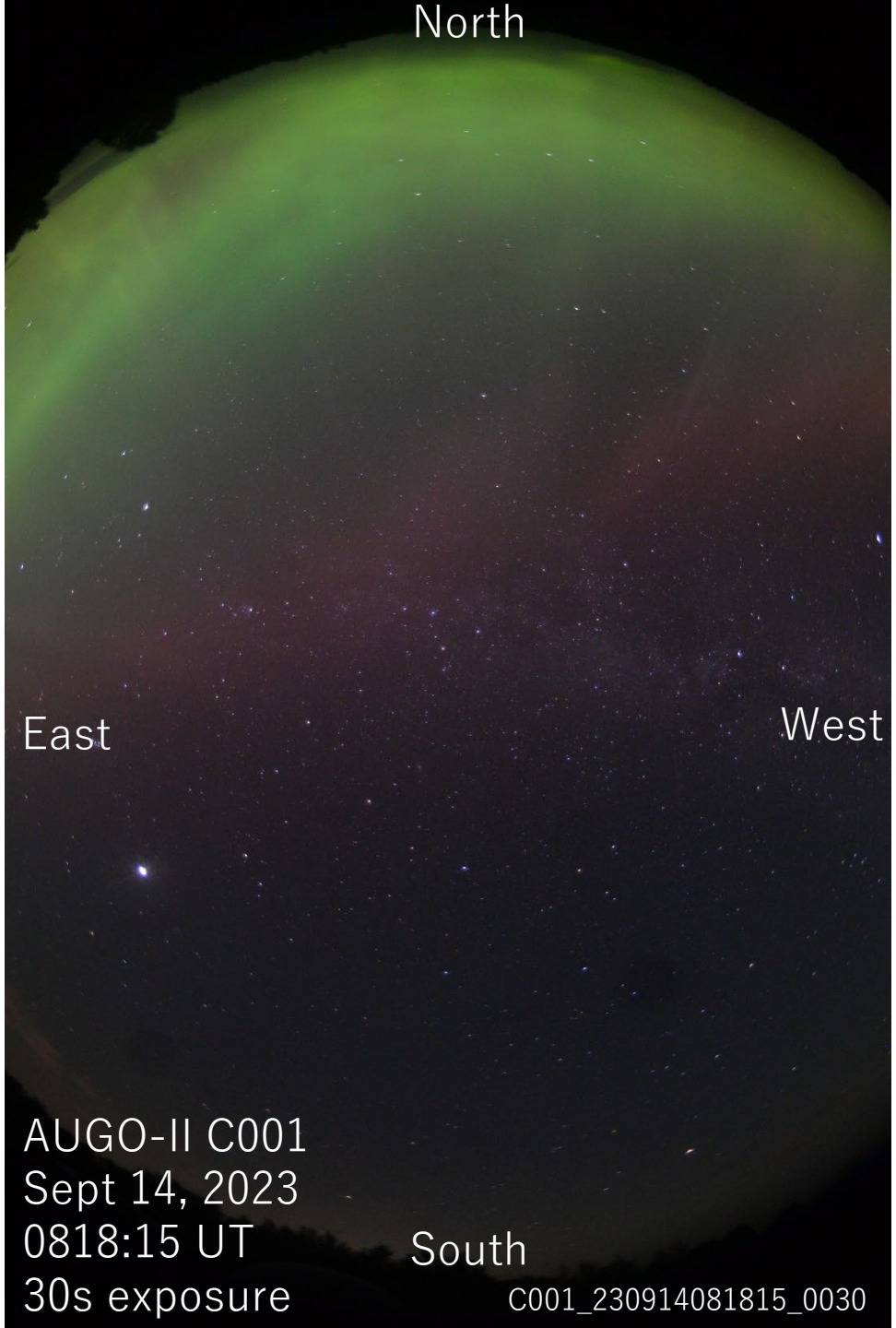






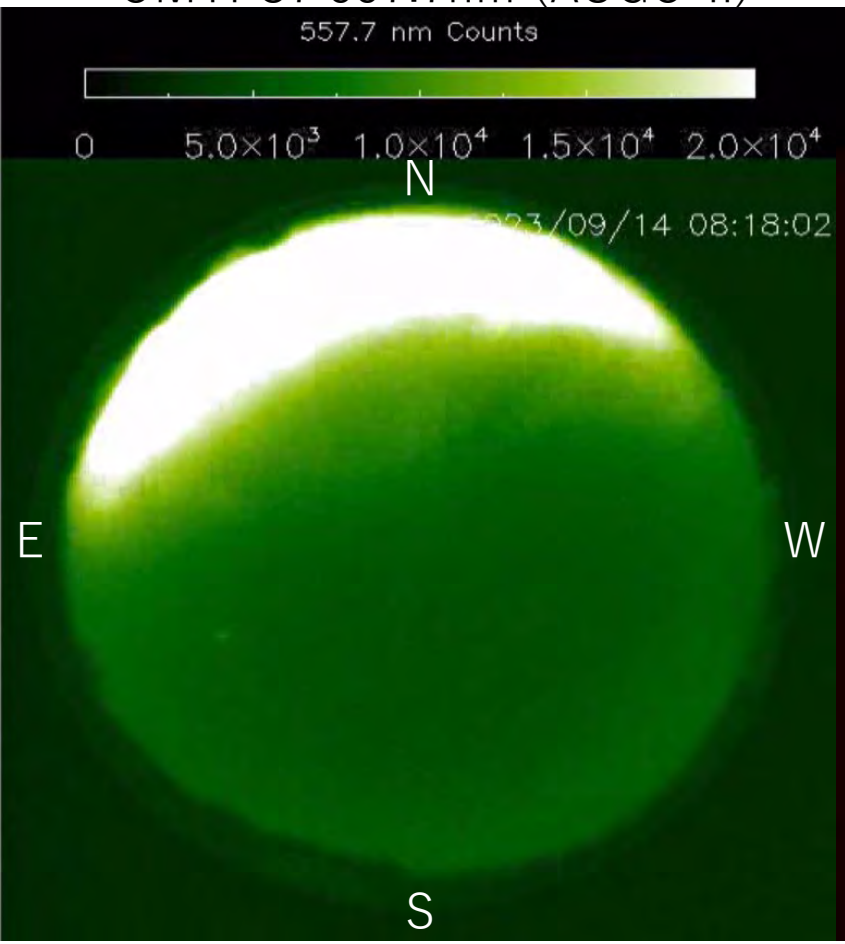
Stable Auroral Red (SAR) arc with ray structures on Sept. 14, 2023 (red/green aurora)





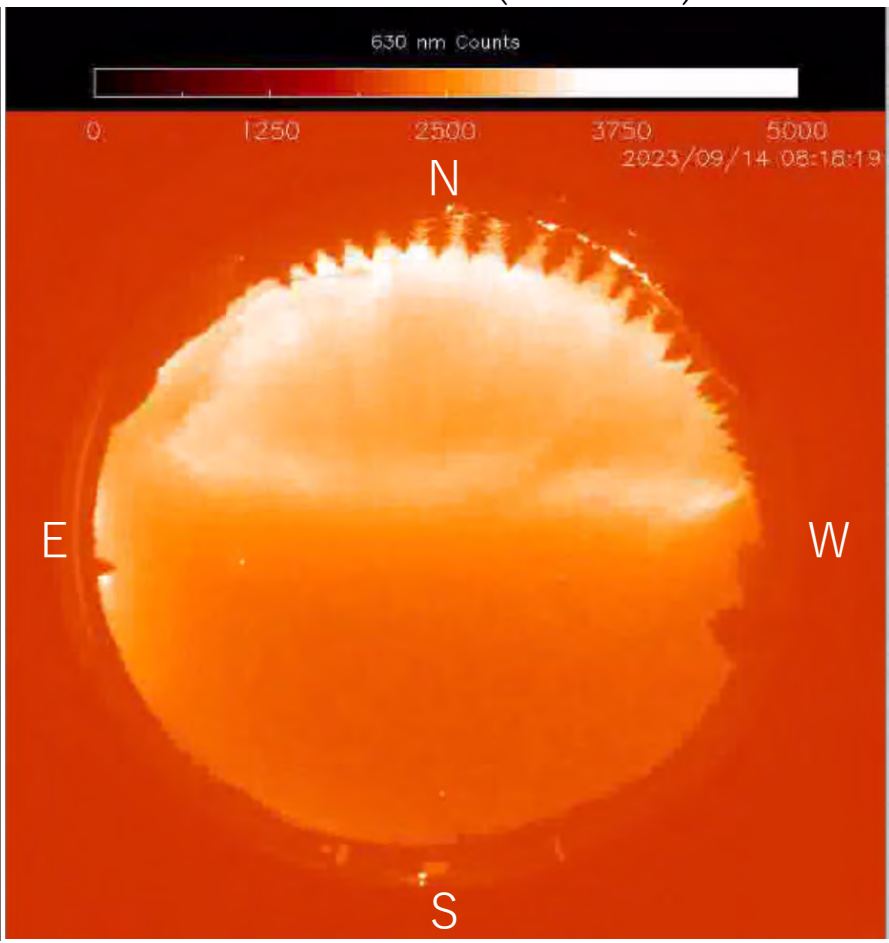
Stable Auroral Red (SAR) arc with ray structures on Sept. 14, 2023 (red/green aurora)

OMTI C7 557.7nm (AUGO-II)

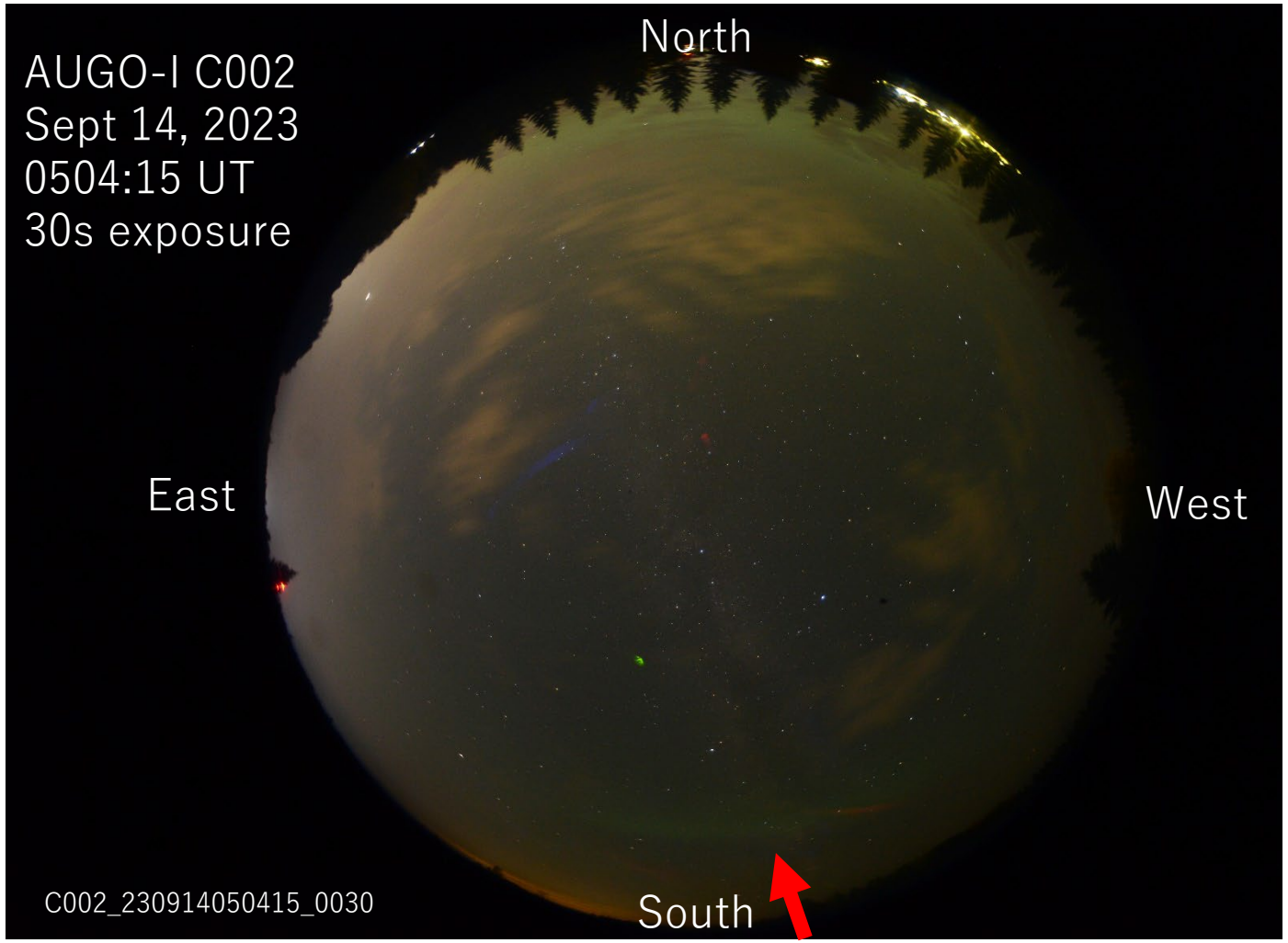


OMTI C7 630.0 nm (AUGO-II)

Z006 630.0 nm (AUGO-I)

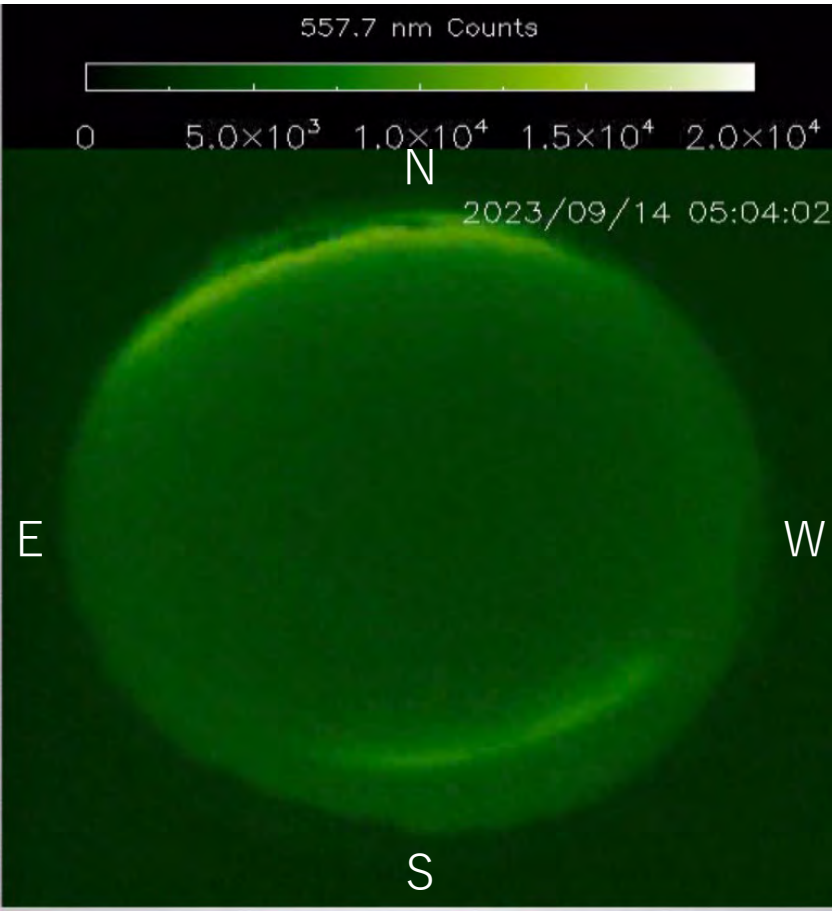


Isolated Proton Aurora on Sept. 14, 2023

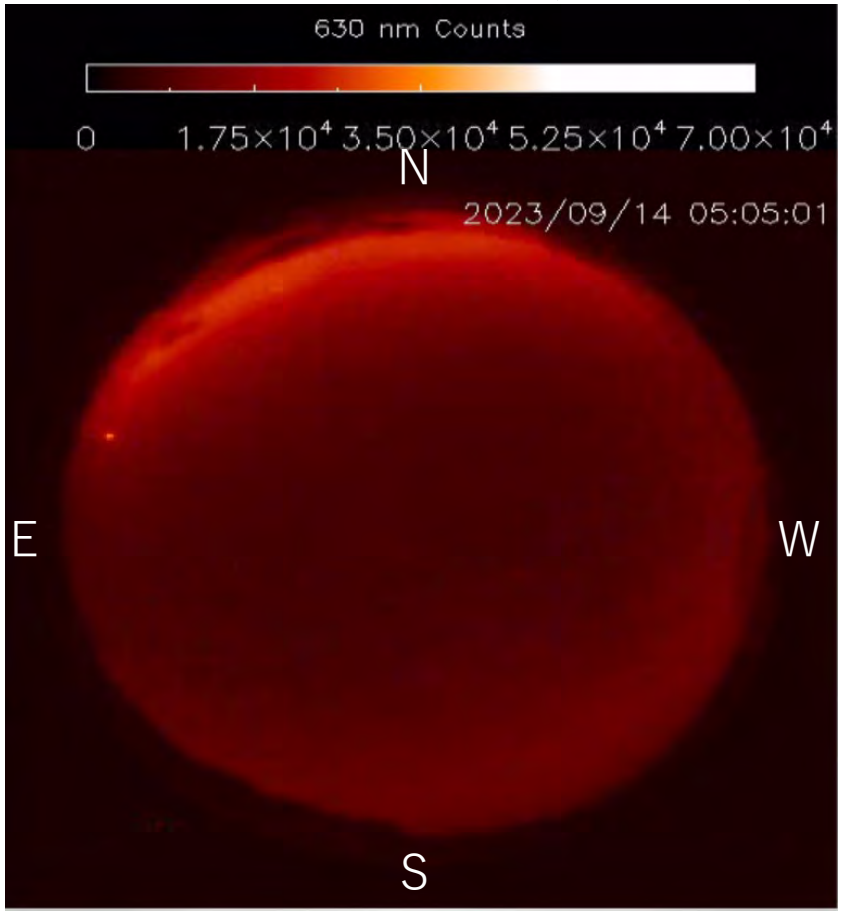


Isolated Proton Aurora on Sept. 14, 2023

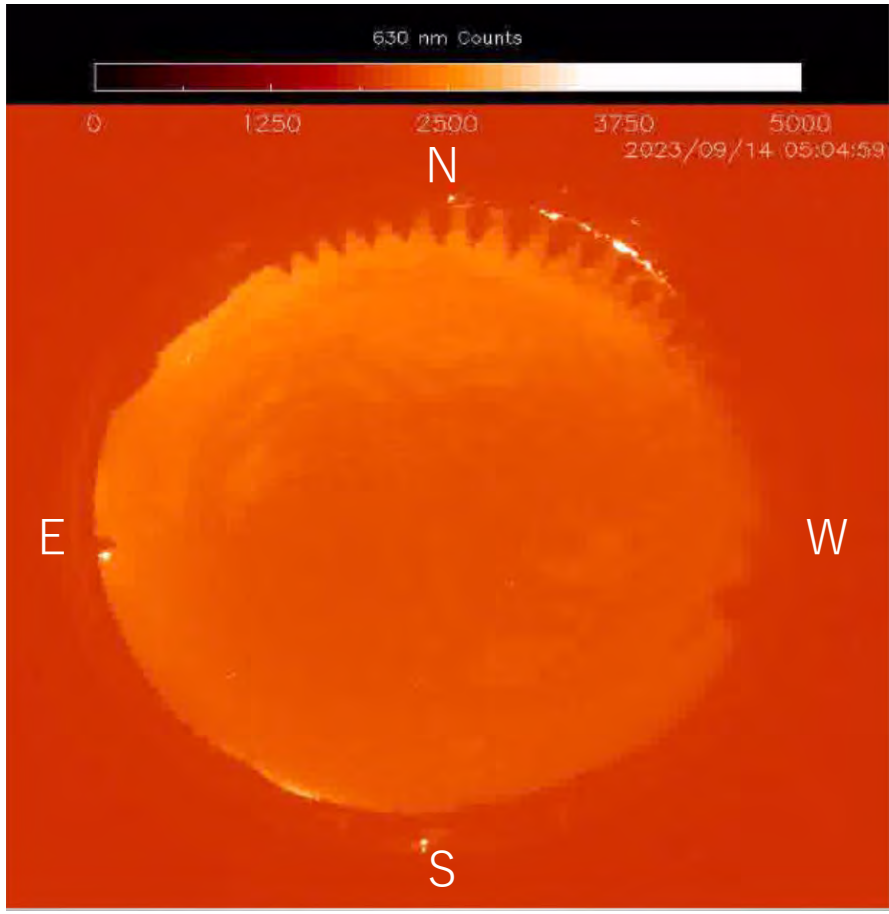
OMTI C7 557.7nm (AUGO-II)



OMTI C7 630.0 nm (AUGO-II)



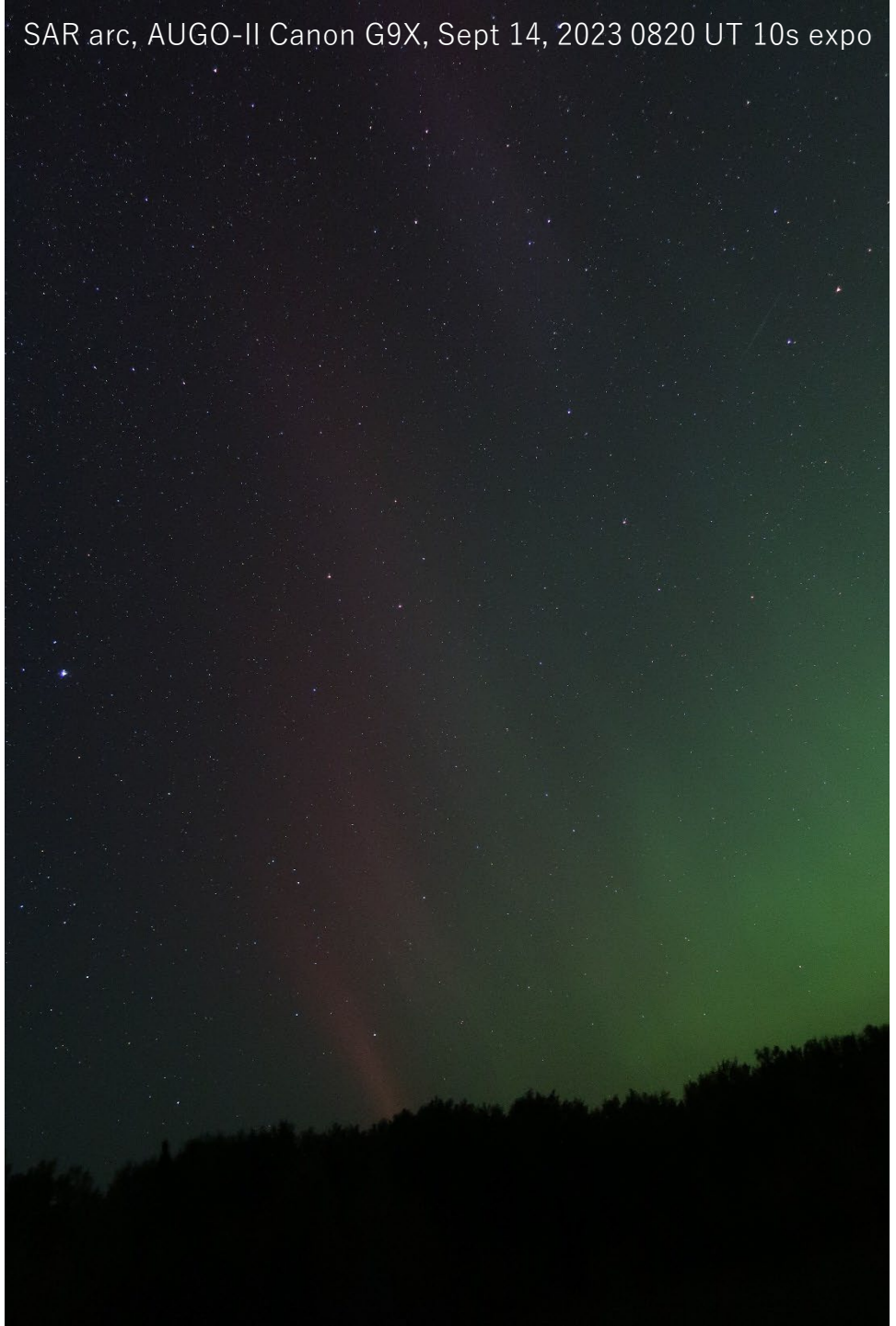
Z006 630.0 nm (AUGO-I)



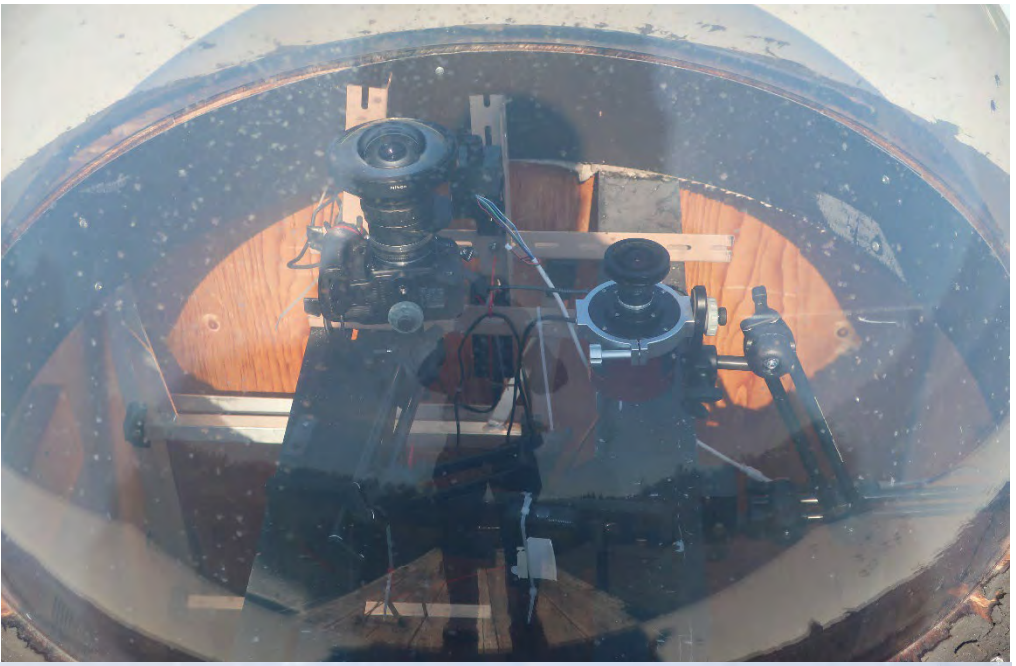
SAR arc, AUGO-II Nikon D40, Sept 14, 2023 0815 UT 20s exposure

Pulsating aurora, AUGO-II Nikon D40, Sept 13, 2023 0659 UT 20s expo

SAR arc, AUGO-II Canon G9X, Sept 14, 2023 0820 UT 10s expo

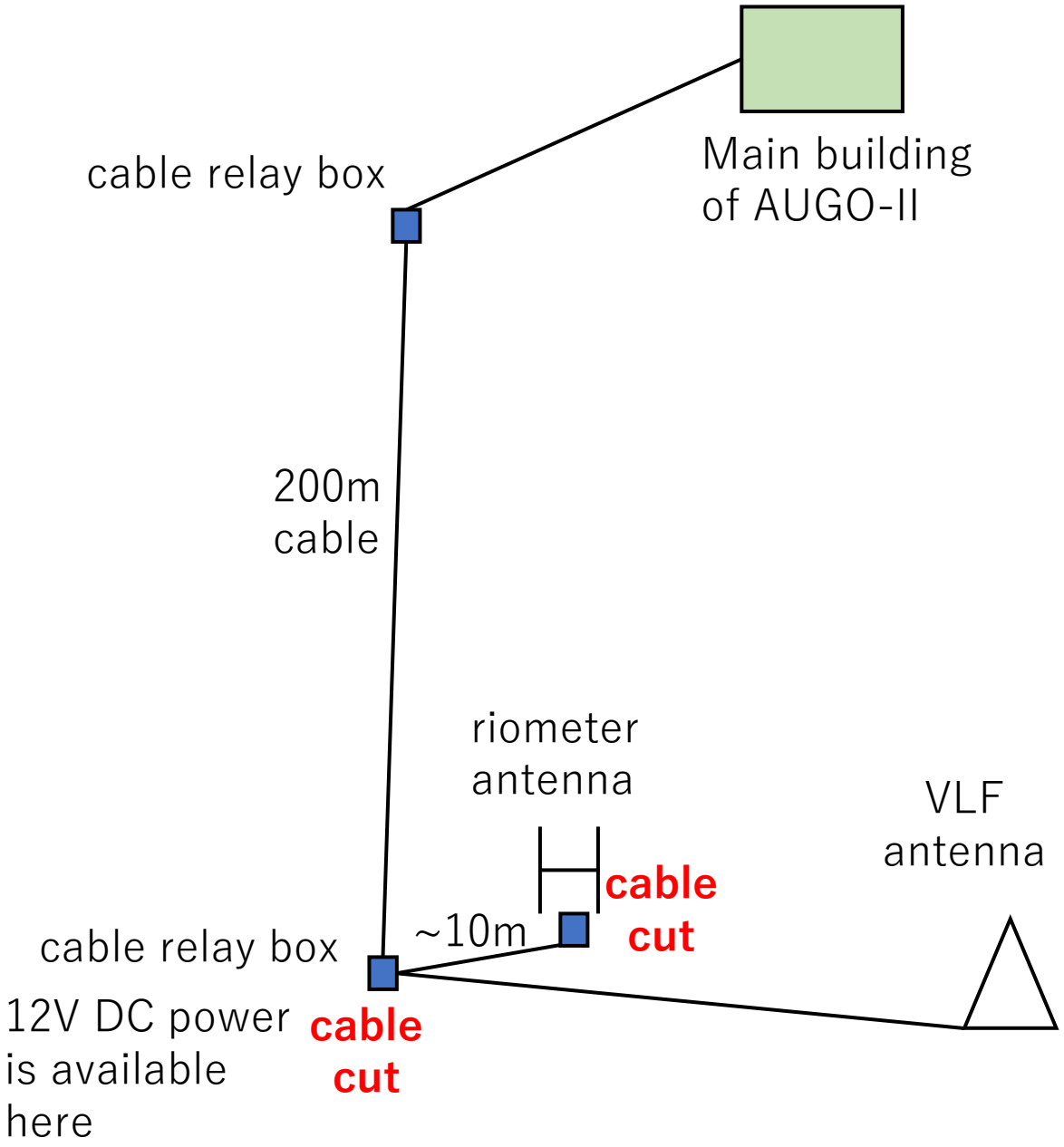


Camera installation at AUGO-I



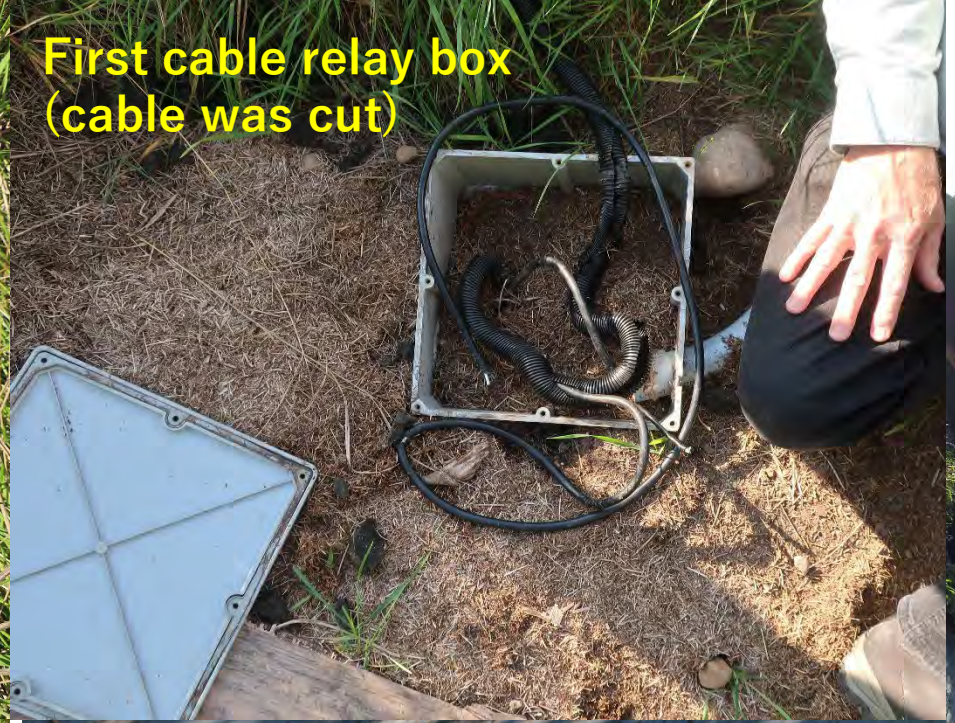
Riometer Trouble

Riometer cable was cut at two points at the preamplifier box and at the first cable relay box.



Riometer Trouble

Riometer preamplifier
(get out from the box,
cable was cut)



First cable relay box
(cable was cut)

Riometer preamplifier box
(opened by animals)

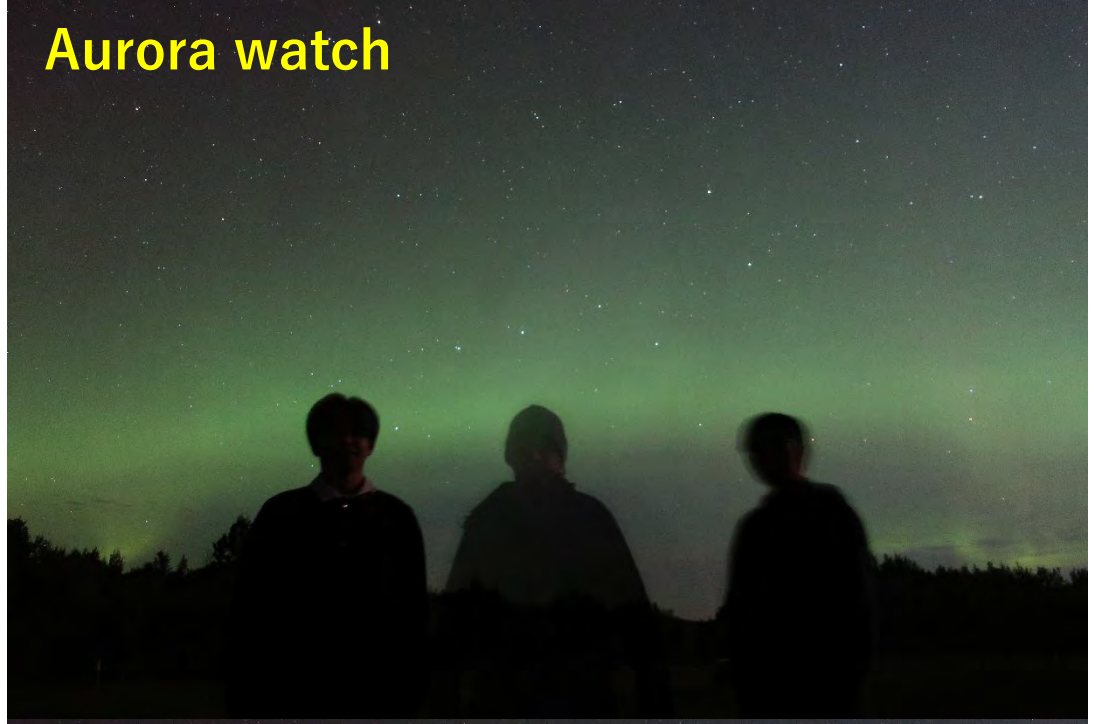
Riometer buffer amplifier
(cable was cut)


Eating


blooming


HIDDEN VALLEY RANCH


ACTIVIA



AUGO-II Canon C9X, Sept 14, 2023 0811 UT 10s exposure

AUGO-II Nikon D40, Sept 14, 2023 0811 UT 20s exposure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