

Association of structured continuum emission with dynamic aurora

Supplementary Material

The supplementary material contains: (1) a list of identified auroral continuum events based on TReX- RGB and spectrograph measurements; and (2) a supplementary figure assembling the optical spectra of the auroral continuum events based on TReX spectrograph data.

Supplementary Table 1. **Summary of observed continuum events analyzed.** Table summarizing intensities of 33 identified continuum events. The time for each event is that for which measurements of the continuum structure were taken from the spectrograph. The 502-507 nm intensity is taken as the band-integrated intensity of the emission enhancement over the median spectrum (see Figure S1 below and explanation). The 557.7 nm and 630.0 nm intensities are taken as the respective line intensities of the emission enhancement. Processed data for all events listed below is publicly available (https://data.phys.ucalgary.ca/sort_by_project/other/publication_datasets/2024SpanswickContinuum/). The TReX-Spectrograph and RGB datasets are also publicly available via the University of Calgary Open Data Platform. Direct data archive access is available via http, ftp, or an API (please see data.phys.ucalgary.ca). Data is organized by site (location), and time of observation (as provided in the table).

Site	Date	Time (UTC)	502-507 nm Intensity (R)	557.7 nm Intensity (R)	630.0 nm Intensity (R)
Rabbit Lake, SK	2021-11-04	4:26:15	76	6343	2173
Lucky Lake, SK	2023-03-15	8:05:15	104	9432	1901
Rabbit Lake, SK	2023-02-16	10:50:30	74	2472	2733
Rabbit Lake, SK	2023-02-16	11:15:00	69	672	211
Rabbit Lake, SK	2023-02-16	11:17:00	119	8014	3420
Lucky Lake, SK	2021-11-04	7:08:45	65	10200	430
Lucky Lake, SK	2023-04-24	5:02:45	138	9623	1180
Rabbit Lake, SK	2023-04-24	8:04:15	62	4965	923
Rabbit Lake, SK	2022-02-03	8:38:45	132	14561	976
Rabbit Lake, SK	2022-02-03	11:26:00	56	2495	562
Rabbit Lake, SK	2021-03-13	9:05:45	131	16433	778
Rabbit Lake, SK	2021-03-20	6:02:45	122	1547	1037
Lucky Lake, SK	2019-08-05	8:49:30	92	9570	474
Lucky Lake, SK	2019-08-05	9:05:15	174	16762	916
Rabbit Lake, SK	2019-12-19	4:38:45	452	11917	646
Rabbit Lake, SK	2021-02-07	7:26:30	108	14140	346
Rabbit Lake, SK	2021-09-08	9:01:45	262	34827	4300
Rabbit Lake, SK	2021-11-04	8:03:15	33	3116	724
Lucky Lake, SK	2023-02-27	6:58:00	36	2321	280
Lucky Lake, SK	2023-05-20	6:11:00	72	7039	1351
Lucky Lake, SK	2023-08-05	5:25:30	76	7920	2414
Lucky Lake, SK	2023-09-19	3:13:15	93	5273	1482
Lucky Lake, SK	2023-12-18	7:41:00	42	7766	517
Rabbit Lake, SK	2023-08-17	7:13:30	53	3715	570
Lucky Lake, SK	2019-07-10	7:13:00	123	13637	504
Rabbit Lake, SK	2020-02-19	8:05:45	131	2986	269
Lucky Lake, SK	2021-10-12	10:51:15	114	10921	1705
Rabbit Lake, SK	2022-02-04	5:17:15	126	23292	500
Rabbit Lake, SK	2022-03-31	3:58:45	152	30813	661
Rabbit Lake, SK	2022-04-02	4:10:00	84	4342	1222
Rabbit Lake, SK	2022-04-07	8:02:15	100	21160	368
Lucky Lake, SK	2022-09-04	7:22:00	187	24977	736
Rabbit Lake, SK	2021-11-04	4:26:15	76	6343	2173

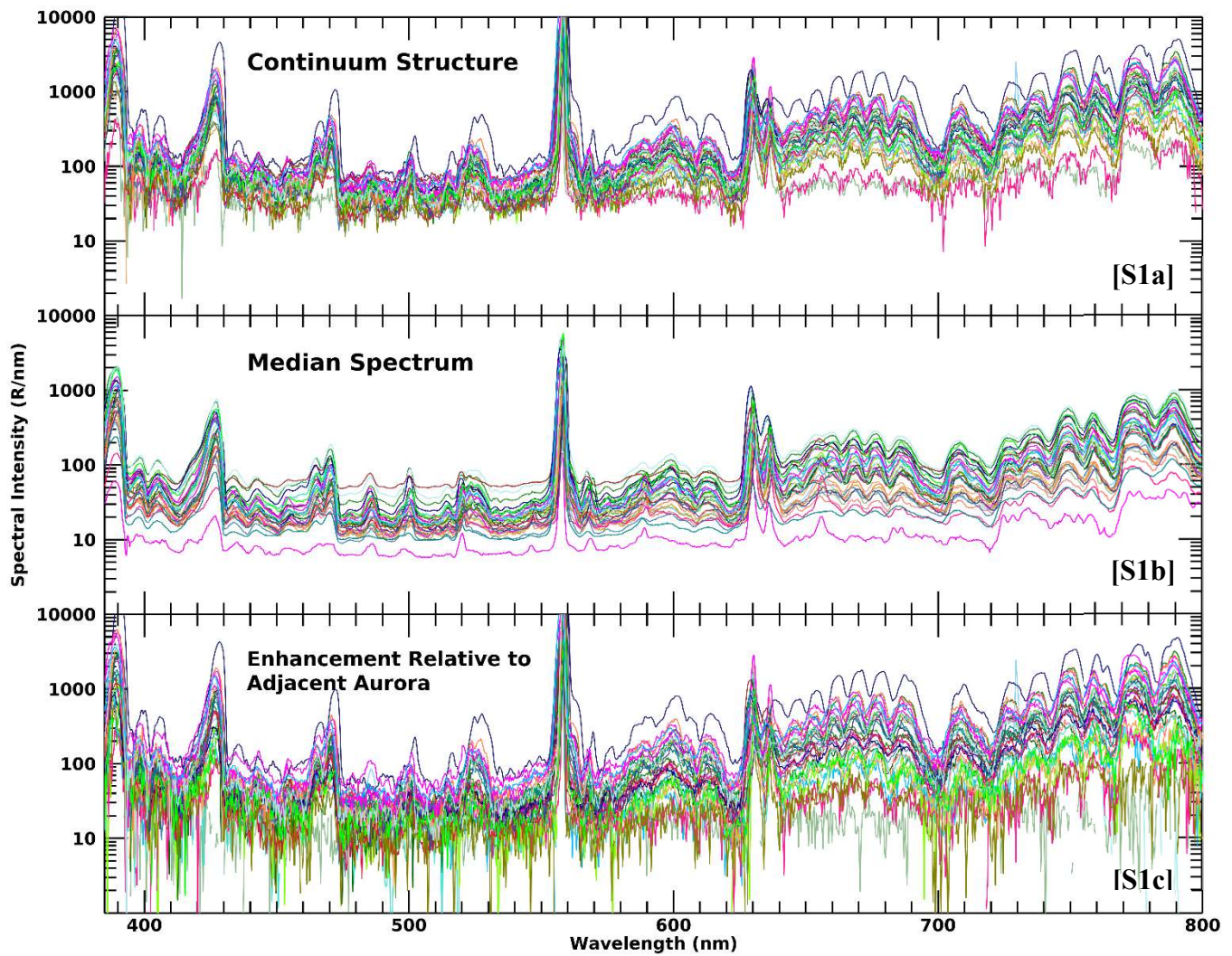


Figure S1. **Spectral properties for identified continuum emission events.** **S1a** Superimposed optical spectrum sampled at a selected bin corresponding to the continuum emission structure in each event, based on TREx spectrograph observations. **S1b** Superposition of “median” spectrum in each event, which serves as an approximate proxy for the ambient auroral spectrum. The median spectrum is calculated as the median profile of all spectra sampled over a ± 5 -min interval centered on the epoch of the continuum spectrum collected in panel S1a, across all elevation bins with elevation angle $> 20^\circ$. **S1c** The enhancement spectrum for each event, which is calculated as the difference between the spectrum of the continuum structure (panel S1a) and the median spectrum (panel S1b) in each event. In the above panels, each individual event is assigned an arbitrary color, used to plot data in all three panels (i.e., the bright green spectra correspond to the same event in all three panels).