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*Supplement of*

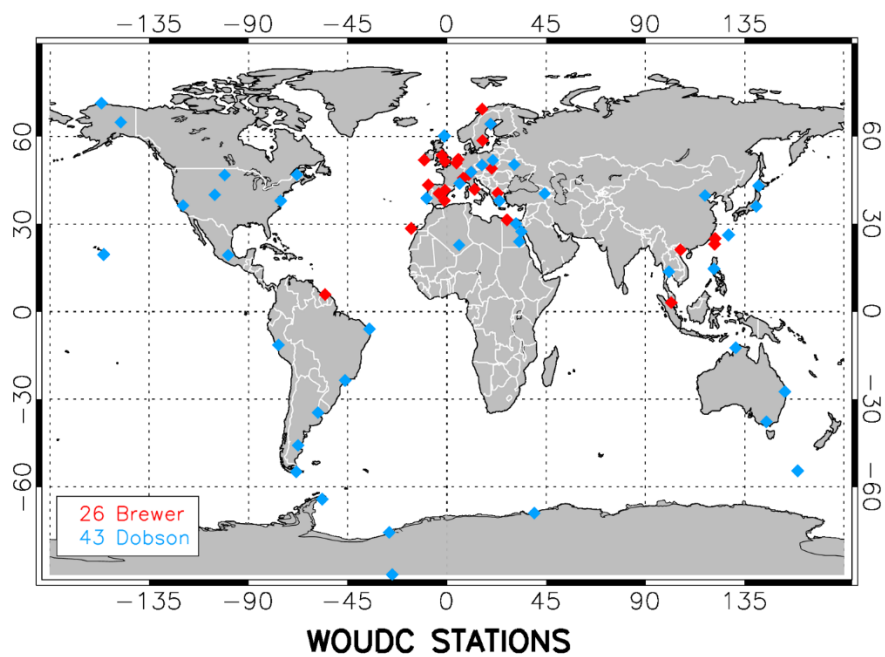
## **TROPOMI/S5P total ozone column data: global ground-based validation and consistency with other satellite missions**

**Katerina Garane et al.**

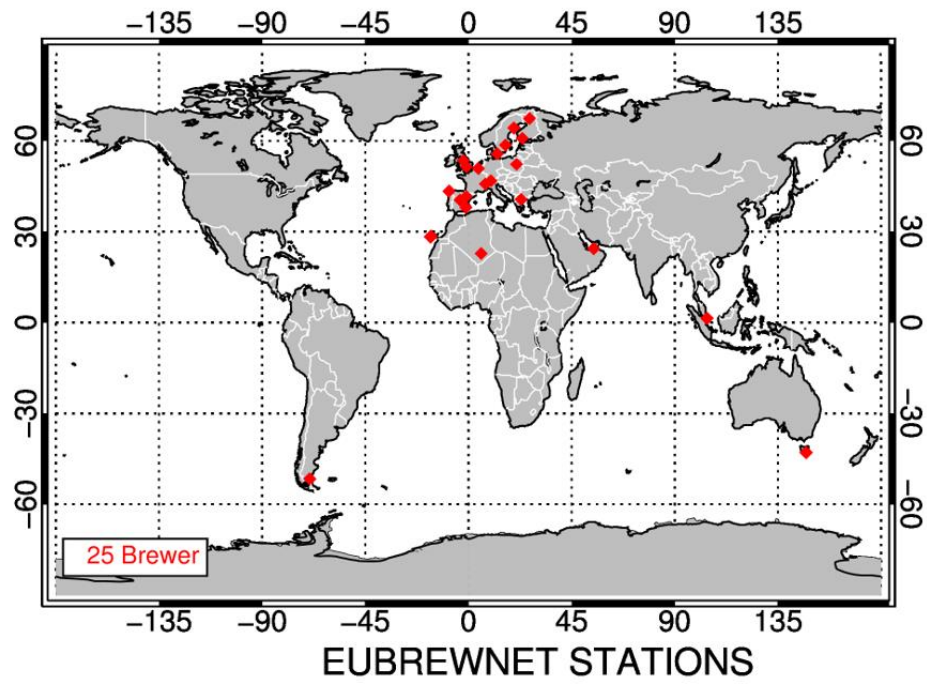
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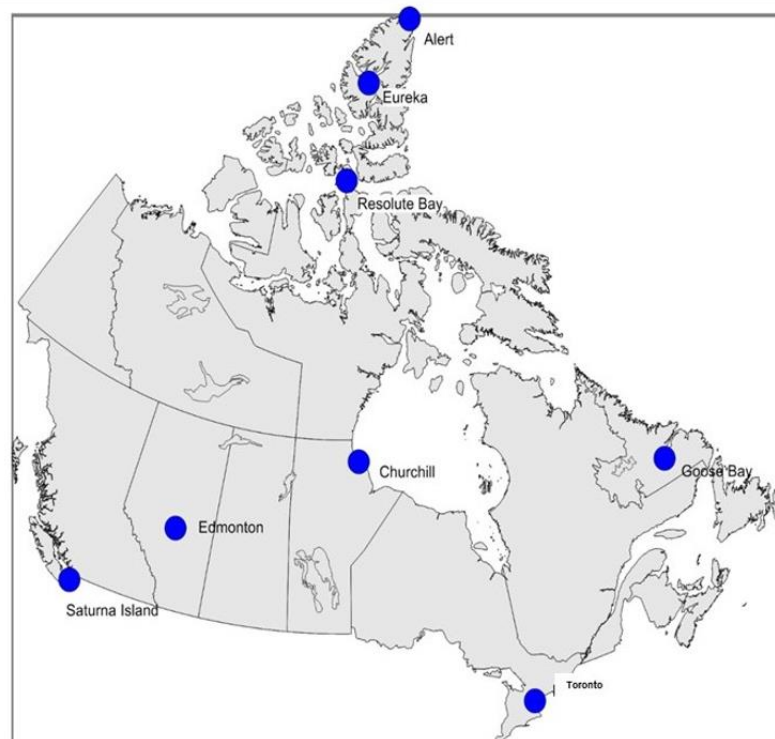
(a)



(b)



(c)



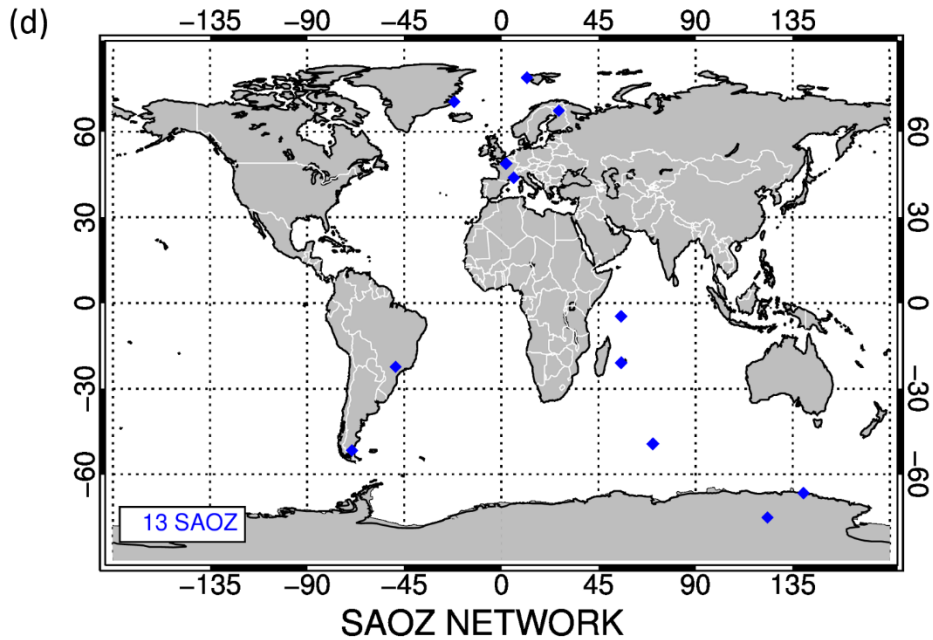


Figure S 1: Maps of the geographical distribution of the stations used for the validation of the TROPOMI TOC. Panel (a) the WOUDC stations, panel (b) Eubrewnet stations, panel (c) the Canadian Brewer stations and panel (d) the SAOZ network.

5 Table S 1. The WOUDC Dobson instruments selected for this study.

Station id	Station name	Location	Latitude	Longitude	Elevation (m.a.s.l.)
2	Tamanrasset	Algeria	22.78	5.51	1395
12	Sapporo	Japan	43.06	141.33	19
14	Tateno	Japan	36.05	140.13	31
19	Bismarck	USA	46.76	-100.75	511
20	Caribou	USA	46.87	-68.01	192
27	Brisbane	Australia	-27.42	153.08	5
29	Macquarie_Island	Australia	-54.49	158.94	6
31	Mauna_Loa	USA	19.54	-155.58	3397
40	Haute_Province	France	43.92	5.75	580
43	Lerwick	UK	60.13	-1.18	90
57	Halley_Bay	Antarctica	-75.62	-26.18	31

67	Boulder	USA	39.99	-105.26	1634
68	Belsk	Poland	51.84	20.79	180
82	Lisbon	Portugal	38.76	-9.13	105
84	Darwin	Australia	-12.42	130.88	0
91	Buenos-Aires	Argentina	-34.59	-58.48	25
96	Hradec_Kralove	Czech Republic	50.18	15.84	285
99	Hohenpeissenberg	Germany	47.80	11.01	975
101	Syowa	Antarctica	-69.00	39.58	21
105	Fairbanks	USA	64.82	-147.87	138
107	Wallops_Island	USA	37.94	-75.46	4
111	Amundsen-Scott	Antarctica	-89.99	-24.8	2835
152	Cairo	Egypt	30.08	31.28	35
190	Naha	Japan	26.20	127.68	29
192	Mexico	Mexico	19.32	-99.16	2268
199	Barrow	USA	71.32	-156.61	11
200	Cachoeira-Paulista	Brazil	-23.50	-46.20	573
208	Shiangher	China	39.75	116.96	13
216	Bangkok	Thailand	13.67	100.62	2
218	Manila	Philippines	14.65	121.05	61
219	Natal	Brazil	-6.00	-35.2	32
233	Marambio	Antarctica	-64.24	-56.62	198
245	Aswan	Egypt	23.96	32.78	193
253	Melbourne	Australia	-37.66	144.83	125
284	Vindeln	Sweden	64.23	19.76	0
293	Athens	Greece	37.98	23.73	15
339	Ushuaia	Argentina	-54.85	-68.31	7
341	Hanford	USA	36.32	-119.63	73
342	Comodoro_Rivadavia	Argentina	-45.78	-67.50	43
409	Hurghada	Egypt	27.41	33.75	22
410	Amberd	Armenia	40.38	44.25	2070

429	Marcapomacocha	Peru	-11.40	-76.33	4479
498	Kyiv-Goloseyev	Ukraine	50.36	30.49	221

**Table S 2. The WOUDC Brewer instruments selected for this study.**

<b>Station id</b>	<b>Station name</b>	<b>Location</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Elevation (m.a.s.l.)</b>
53	Uccle	Belgium	50.79	4.36	100
95	Taipei	Taiwan	25.02	121.48	22
96	Hradec_Kralove	Czech Republic	50.18	15.84	285
99	Hohenpeissenberg	Germany	47.80	11.01	975
261	Thessaloniki	Greece	40.63	22.96	4
279	Norkoping	Sweden	58.58	16.15	0
284	Vindeln	Sweden	64.23	19.77	0
305	Rome_University	Italy	41.90	12.52	0
306	Chengkung	Taiwan	23.10	121.37	0
308	Madrid	Spain	40.45	-3.72	0
316	Debilt	Netherlands	52.10	5.18	0
318	Valentia	Ireland	51.94	-10.25	0
322	Petaling_Jaya	Malaysia	3.10	101.65	46
330	Hanoi	Vietnam	21.20	105.80	0
331	Poprad-Ganovce	Slovakia	49.03	20.32	0
346	Murcia	Spain	38.00	-1.17	69
352	Manchester	UK	53.47	-2.23	61
353	Reading	UK	51.44	-0.94	51
376	Mrsa_Mtrouh	Egypt	31.33	27.22	35
401	Santa_Cruz	Spain	28.47	-16.25	50
405	La_Coruna	Spain	43.33	-8.47	62
411	Zaragoza	Spain	41.63	-0.91	235
435	Paramaribo	Suriname	5.81	-55.21	5

476	Andoya	Norway	69.28	16.01	395
479	Aosta	Italy	45.74	7.357	585
501	Davos	Switzerland	46.81	9.84	1605

**Table S 3. The SAOZ DOAS UV-Visible instruments selected for this study.**

Station id	Station name	Location	Latitude	Longitude	Elevation (m.a.s.l.)	Instrument
---	Guyancourt	France	48.78	2.03	165	SAOZ
28	Dumont D' Urville	Antarctica	-66.67	140.02	20	SAOZ
40	Observatoire De Haute Provence	France	43.94	5.71	650	SAOZ
49	Paris	France	48.85	2.35	65	SAOZ
89	Ny Alesund	Spitsbergen	78.92	11.93	15	DOAS
207	Mahe	Victoria, Seychelles	-4.68	55.53	15	SAOZ
262	Sodankyla	Finland	67.37	26.63	179	SAOZ
436	St. Denis – La Reunion	France	-20.90	55.48	110	SAOZ
459	Scoresbysund	Eastern Greenland	70.48	-21.95	68	SAOZ
614	Bauru	Brazil	-22.35	-49.03	640	SAOZ
641	Dome Concorde	Antarctica	-75.10	123.32	3233	SAOZ
674	Kerguelen	Kerguelen Island	-49.35	70.26	10	SAOZ
817	Rio Gallegos	Argentina	-51.60	-69.32	650	SAOZ

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**Table S 4. The Canadian Brewer Network stations selected for this study.**

Station id	Station name	Location	Latitude	Longitude	Elevation (m.a.s.l.)
18	Alert	Canada	82.45	-62.51	220
21	Edmonton	Canada	53.51	-114.11	752
24	Resolute	Canada	74.70	-94.97	68

65	Toronto	Canada	43.78	-79.47	202
76	Goose Bay	Canada	53.31	-60.36	26
77	Churchill	Canada	58.74	-94.07	26
111	Amundsen Scott (South Pole)	Antarctica	-90.00	70.24	3507
290	Saturna Island	Canada	48.77	-123.13	202
315	Eureka	Canada	79.99	-85.93	9

**Table S 5. The Eubrewnet Network stations selected for this study.**

Station id	Station name	Location	Latitude	Longitude	Elevation (m.a.s.l.)
2	Tamanrasset	Algeria	22.79	5.53	1320
53	Uccle	Belgium	50.79	4.36	100
92	Hobart	Australia	-42.90	147.33	20
214	Singapore	SGP	1.37	103.98	14
262	Sodankyla	Finland	67.37	26.63	100
279	Norrkoping	Sweden	58.58	16.15	43
284	Vindeln	Sweden	64.24	19.77	225
300	Izana	Spain	28.31	-16.49	2370
308	Madrid	Spain	40.45	-3.72	680
346	Murcia	Spain	38.00	-1.17	69
352	Manchester	GBR	53.47	-2.23	76
353	Reading	GBR	51.44	-0.94	61
397	Abu Dhabi	United. Arab.Emirates	24.34	54.64	20
401	Santa_Cruz (Tenerife)	Spain	28.47	-16.25	52
404	Jokioinen	Finland	60.81	23.49	106
405	La Coruna	Spain	43.33	-8.47	62
411	Zaragoza	Spain	41.63	-0.91	250
479	Aosta	Italy	45.74	7.36	569



493	Rio Gallegos	Argentina	-51.60	-69.32	5
501	Davos	Switzerland	46.80	9.83	1560
934	Copenhagen	Denmark	55.72	12.57	90
945	Warsaw	Poland	52.25	20.94	120