

1 Supplementary materials

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3 Table 1. Summary of the comparison between SWIR L2 V02.xx products and TCCON

4 measurements (GGG2012) for whole available period. All available data are used.

5 The GOSAT data are retrieved within ± 5 degrees latitude/longitude box centered at

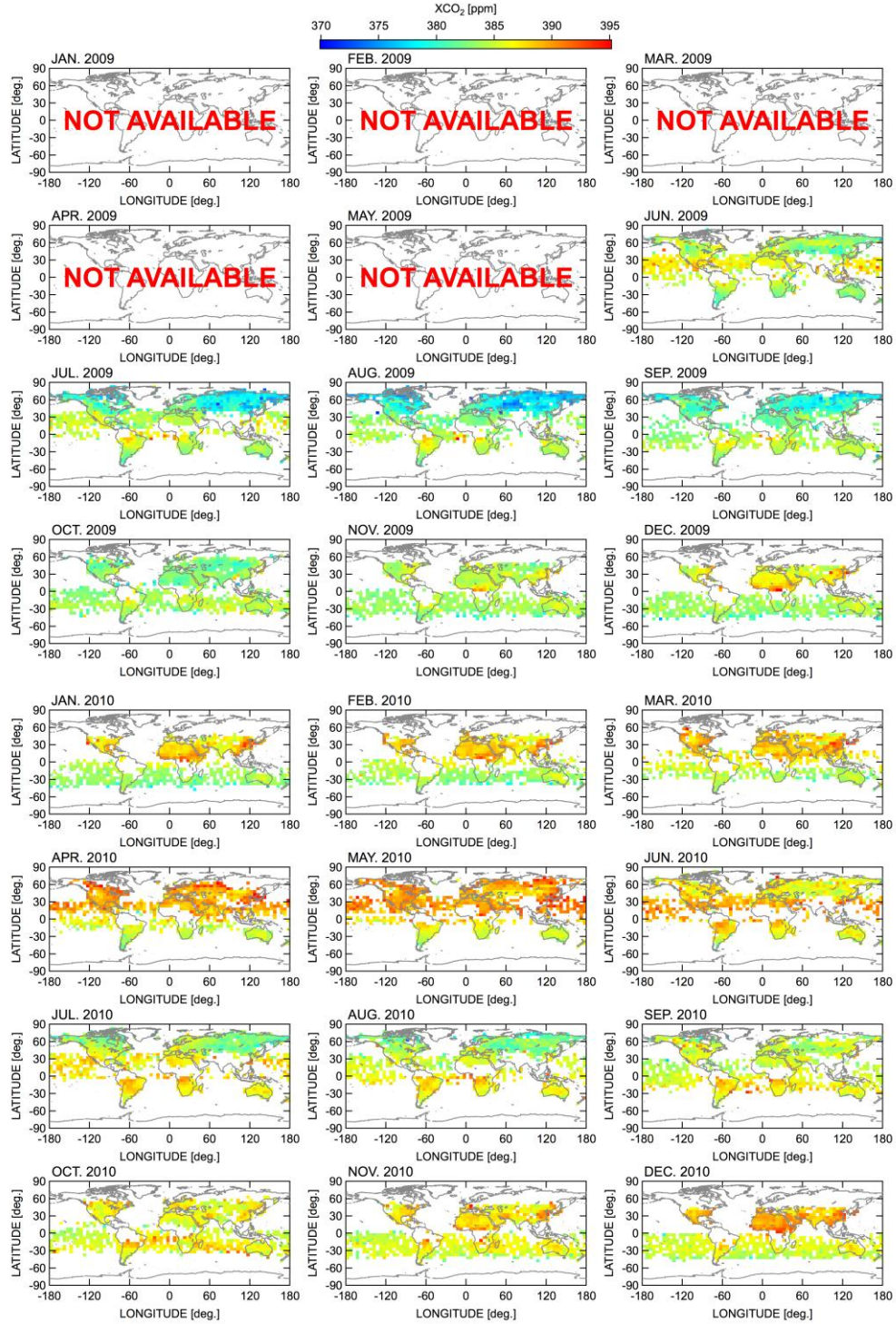
6 each TCCON site and TCCON data are the mean values measured within ± 30 min. of

7 GOSAT overpass time. N , A , and σ indicate number of matched data, average of their

8 differences, and standard deviation of their differences.

Site	Latitude [deg.]	Longitude [deg.]	GOSAT - TCCON (GGG2012)					
			whole available period					
			XCO ₂			XCH ₄		
			N	A [ppm]	σ [ppm]	N	A [ppb]	σ [ppb]
Sodankyla	67.37	26.63	70	-0.86	2.14	70	-6.6	13.0
Bialystok	53.23	23.03	34	-1.63	1.81	34	-2.5	13.1
Bremen	53.10	8.85	11	-0.55	2.19	11	0.6	12.1
Orleans	47.97	2.11	66	-1.62	1.81	66	-5.0	10.7
Garmisch	47.48	11.06	87	-0.32	2.01	87	7.9	13.0
Park Falls	45.95	-90.27	303	-1.31	2.09	303	-0.8	13.5
Lamont	36.60	-97.49	1255	-2.23	1.68	1255	-7.8	13.3
Tsukuba	36.05	140.12	106	0.70	2.51	106	2.7	12.0
Darwin	-12.42	130.89	161	-2.35	1.69	161	-12.6	9.5
Wollongong	-34.41	150.88	327	-1.30	2.15	329	-12.3	14.7
Lauder	-45.04	169.68	37	-1.73	2.54	43	-6.4	15.2
Total			2457	-1.73	2.03	2465	-6.6	14.0

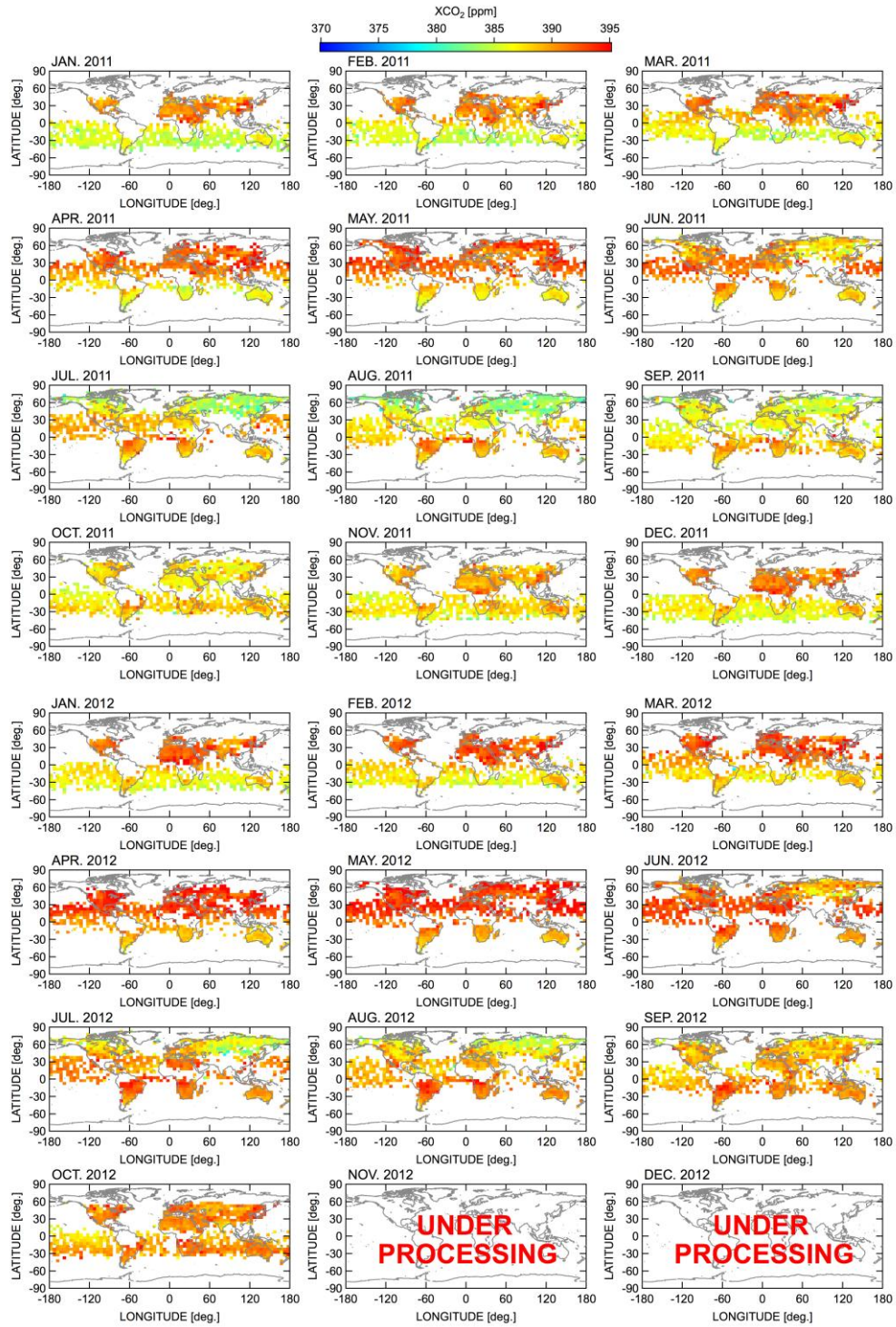
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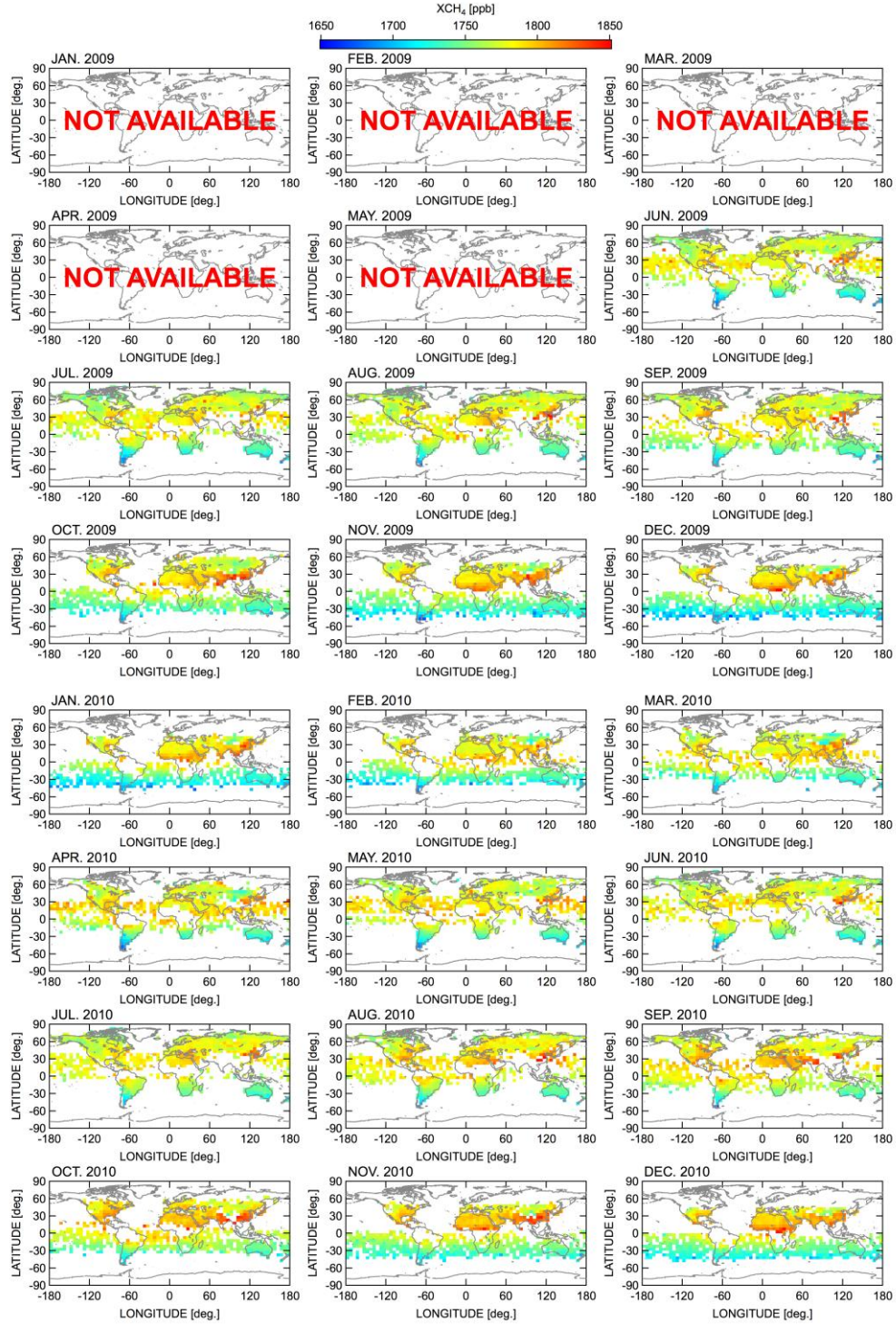
2 Fig. 1. Monthly averages of the retrieved XCO₂ within 5 x 5 degree grid boxes. A

3 blank indicates that no valid retrieval result was available within the grid box.



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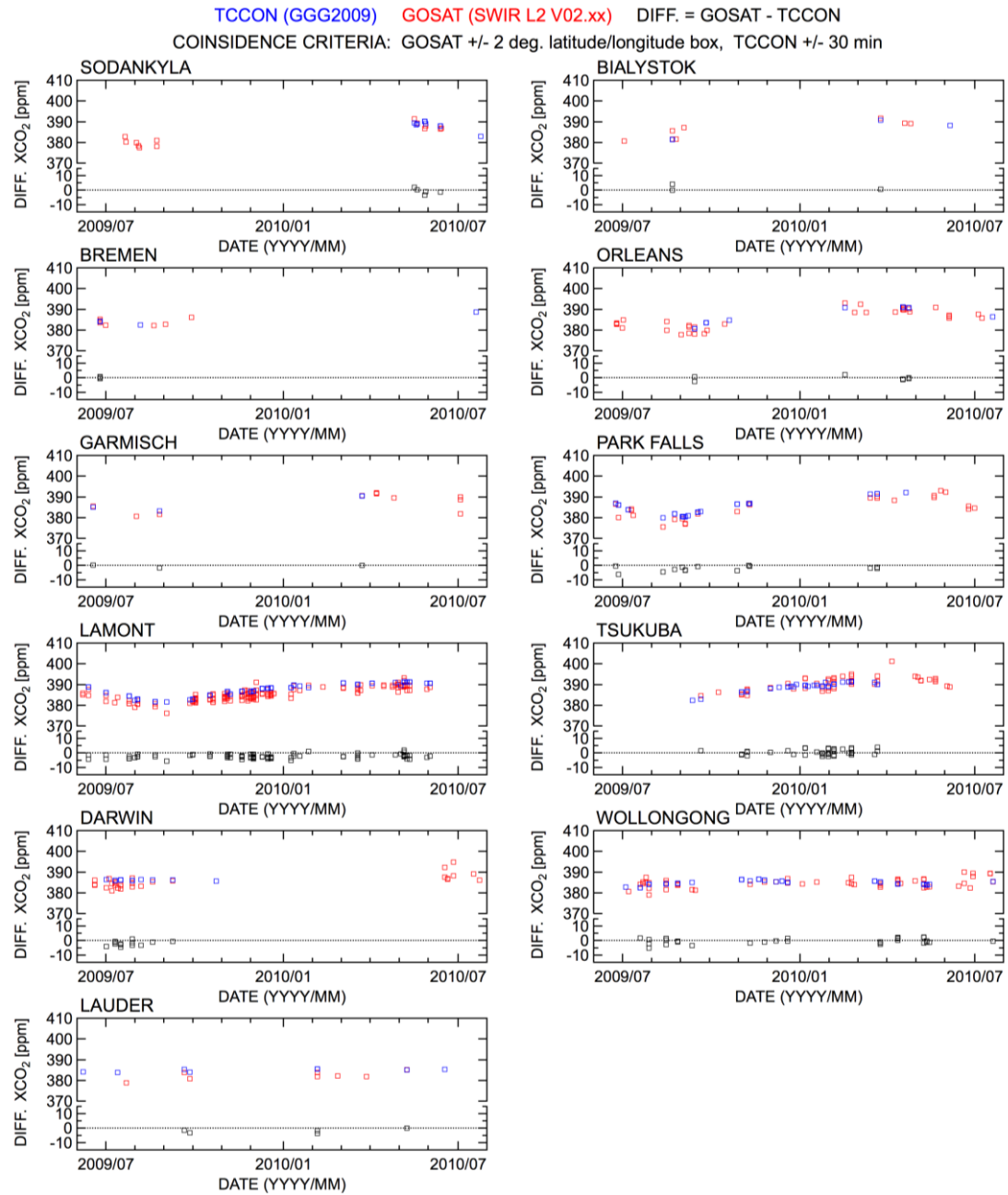
2 Fig. 1. Continued.



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2 Fig. 2. Monthly averages of the retrieved XCH₄ within 5 x 5 degree grid boxes. A

3 blank indicates that no valid retrieval result was available within the grid box.



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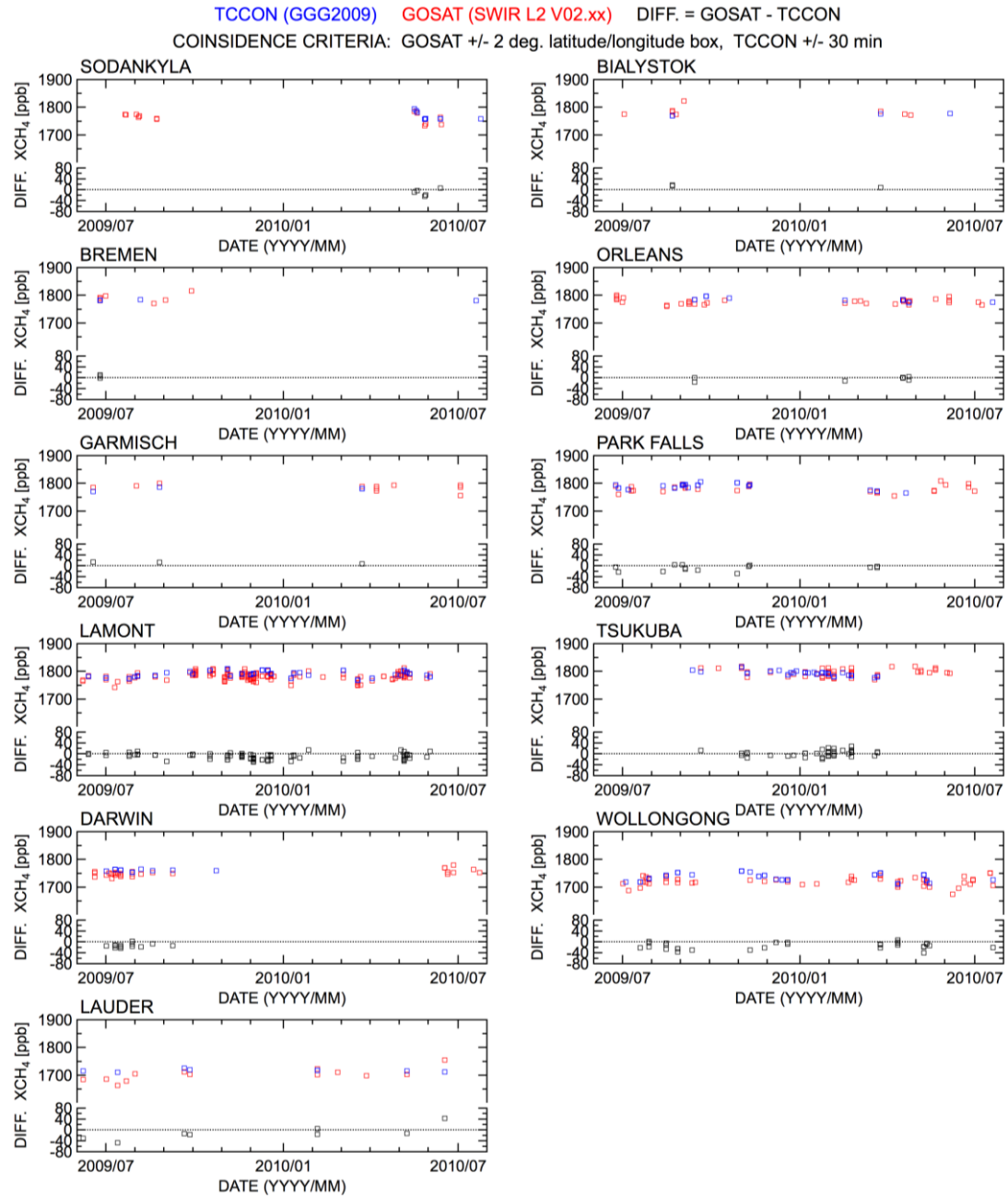
2 Figure 3. Time series of the SWIR L2 V02.xx and TCCON XCO₂ (GGG2009) and their

3 difference for each TCCON site. Only the matched data until July 2010 are used.

4 The GOSAT data are retrieved within ± 2 degrees latitude/longitude box centered at

5 each TCCON site and TCCON data are the mean values measured within ± 30 min of

6 GOSAT overpass time.



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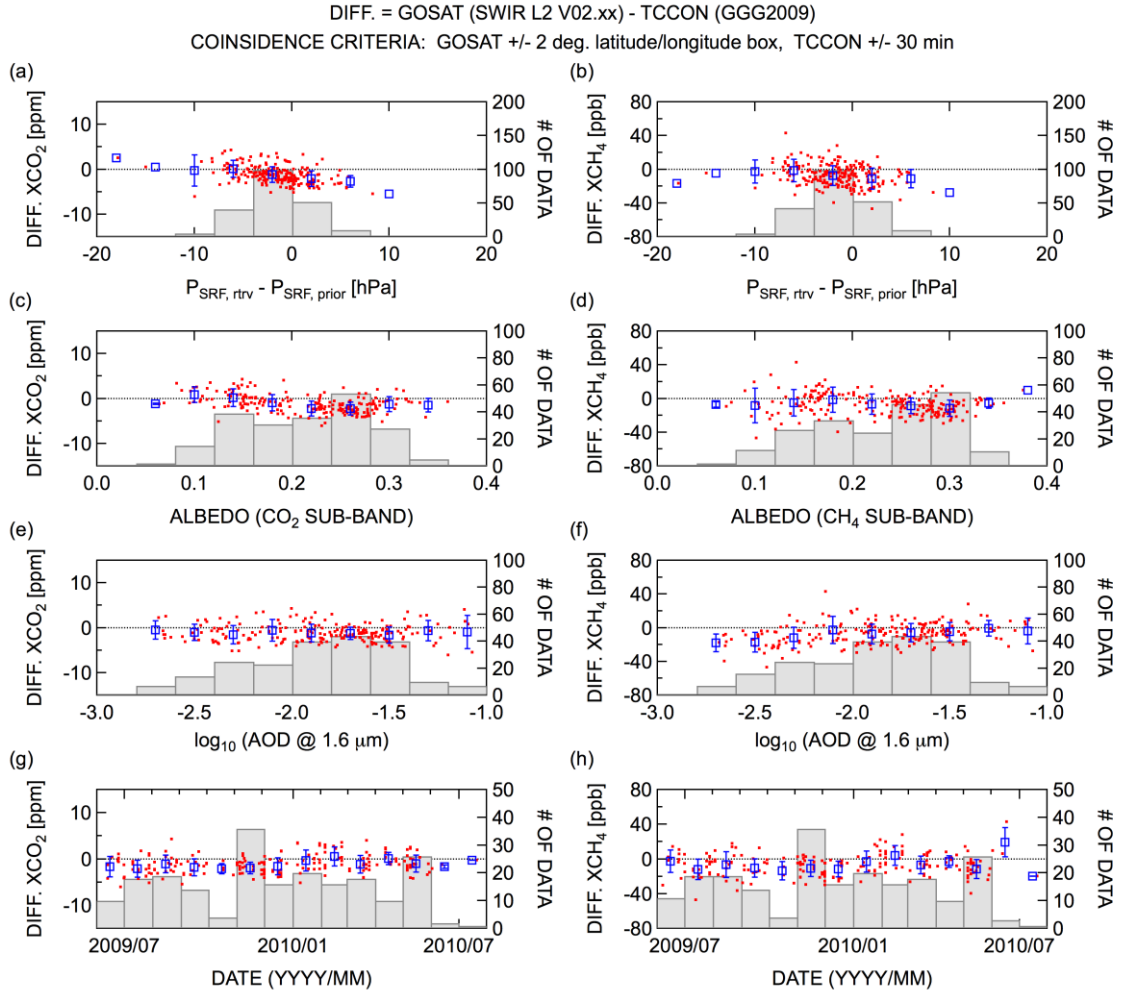
2 Figure 4. Time series of the SWIR L2 V02.xx and TCCON XCH₄ (GGG2009) and their

3 difference for each TCCON site. Only the matched data until July 2010 are used.

4 The GOSAT data are retrieved within ± 2 degrees latitude/longitude box centered at

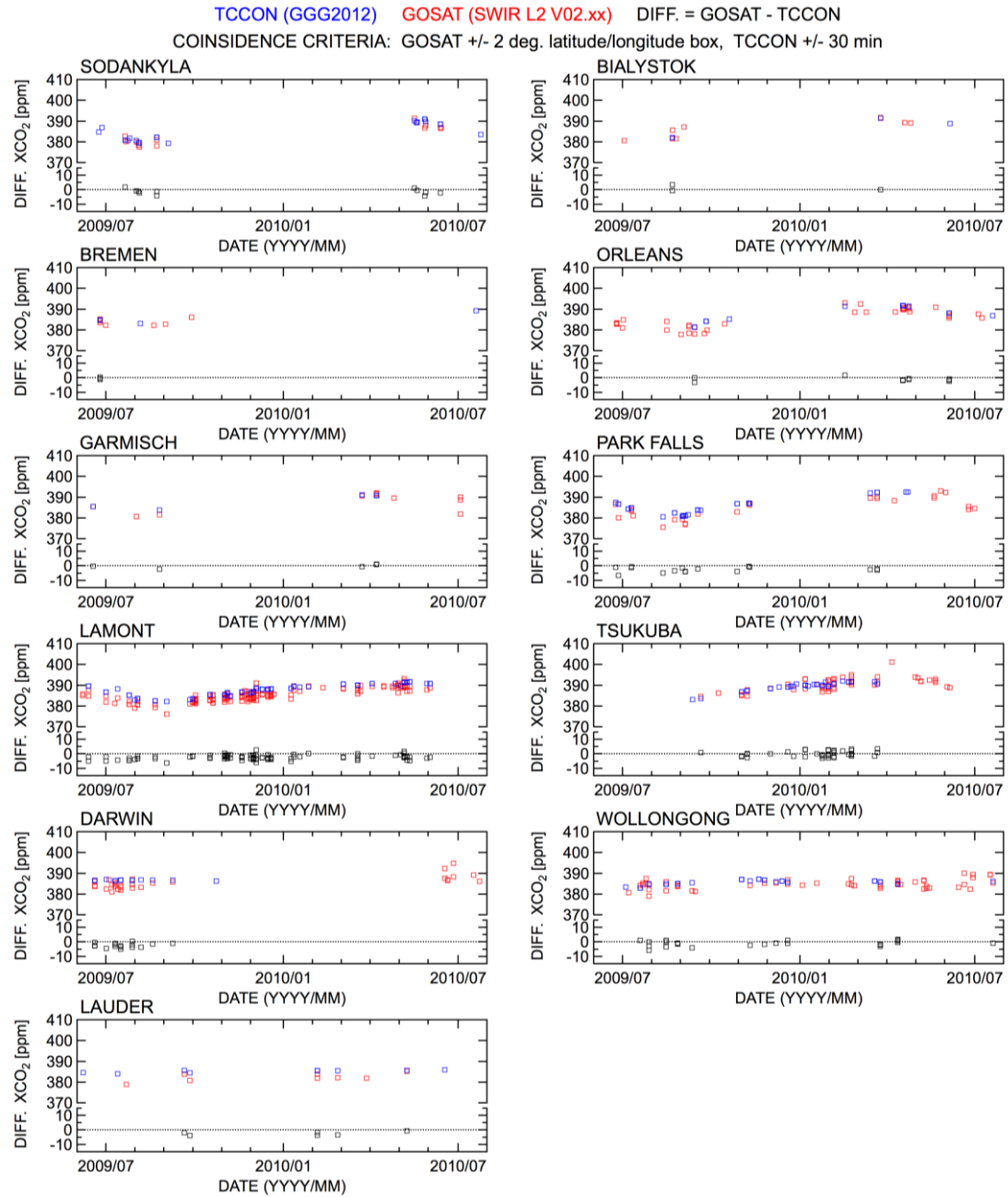
5 each TCCON site and TCCON data are the mean values measured within ± 30 min of

6 GOSAT overpass time.



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2 Figure 5. Difference between the SWIR L2 V02.xx and TCCON data (GGG2009) as a
3 function of (a, b) retrieved surface pressure, (c, d) retrieved surface albedo, (e, f)
4 retrieved AOD, and (g, h) time for XCO₂ and XCH₄, respectively. Only the matched
5 data until July 2010 are used. Red dots are the individual results and the average and
6 standard deviation are shown in blue square and vertical bars. Gray histograms show
7 the number of data contains within each bin.



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2 Figure 6. Time series of the SWIR L2 V02.xx and TCCON XCO₂ (GGG2012) and their

3 difference for each TCCON site. Only the matched data until July 2010 are used.

4 The GOSAT data are retrieved within ± 2 degrees latitude/longitude box centered at

5 each TCCON site and TCCON data are the mean values measured within ± 30 min of

6 GOSAT overpass time.

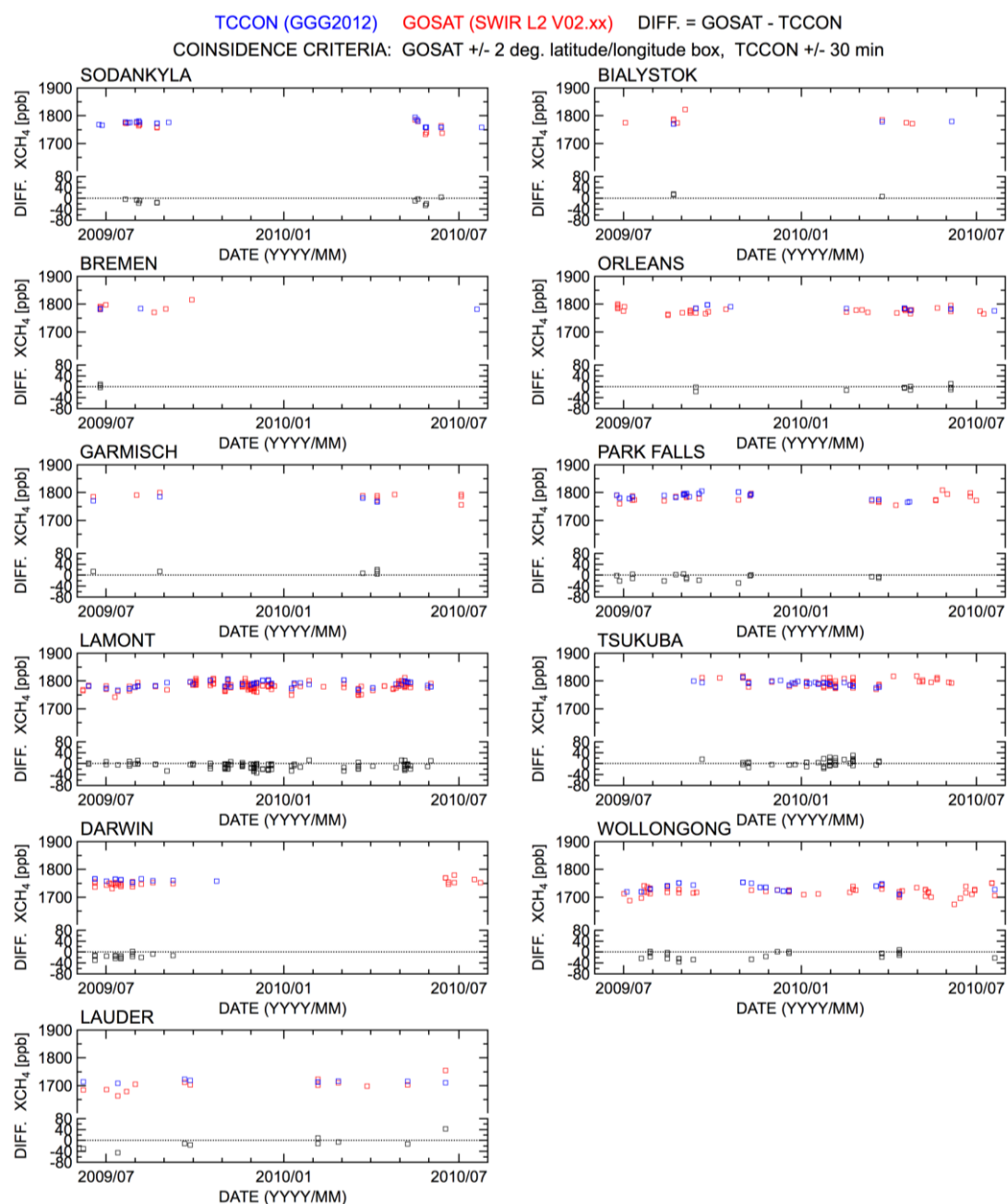
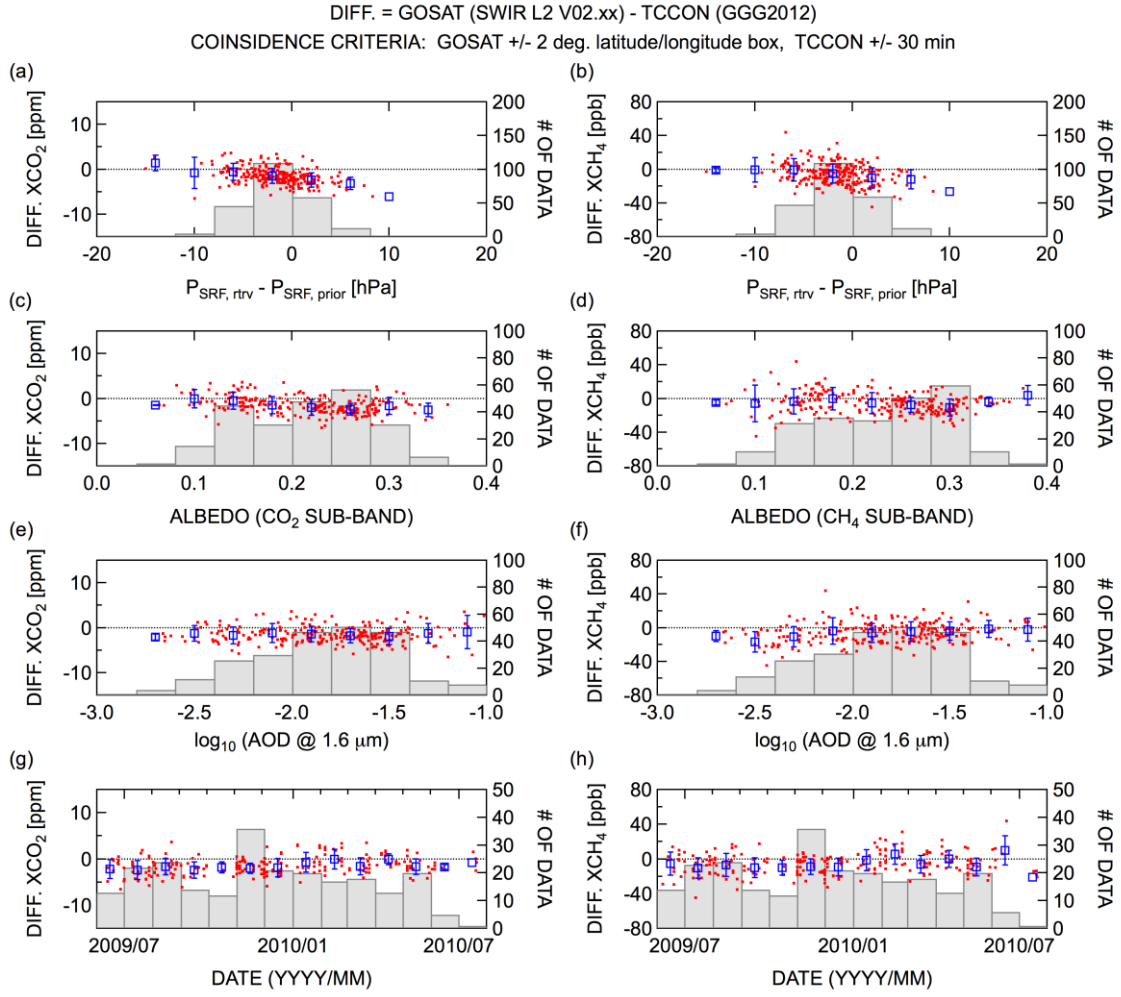
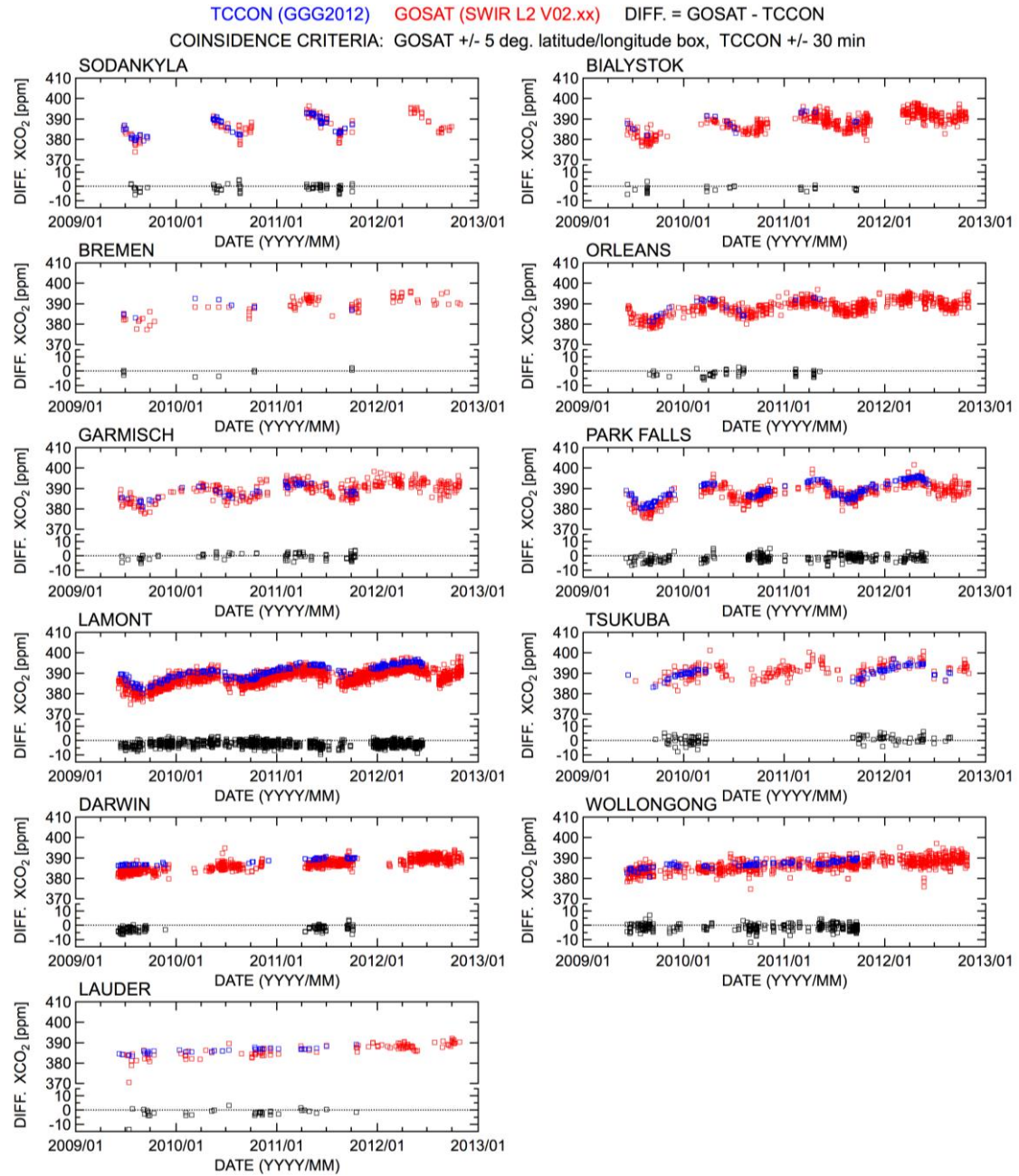


Figure 7. Time series of the SWIR L2 V02.xx and TCCON XCH_4 (GGG2012) and their difference for each TCCON site. Only the matched data until July 2010 are used. The GOSAT data are retrieved within ± 2 degrees latitude/longitude box centered at each TCCON site and TCCON data are the mean values measured within ± 30 min of GOSAT overpass time.



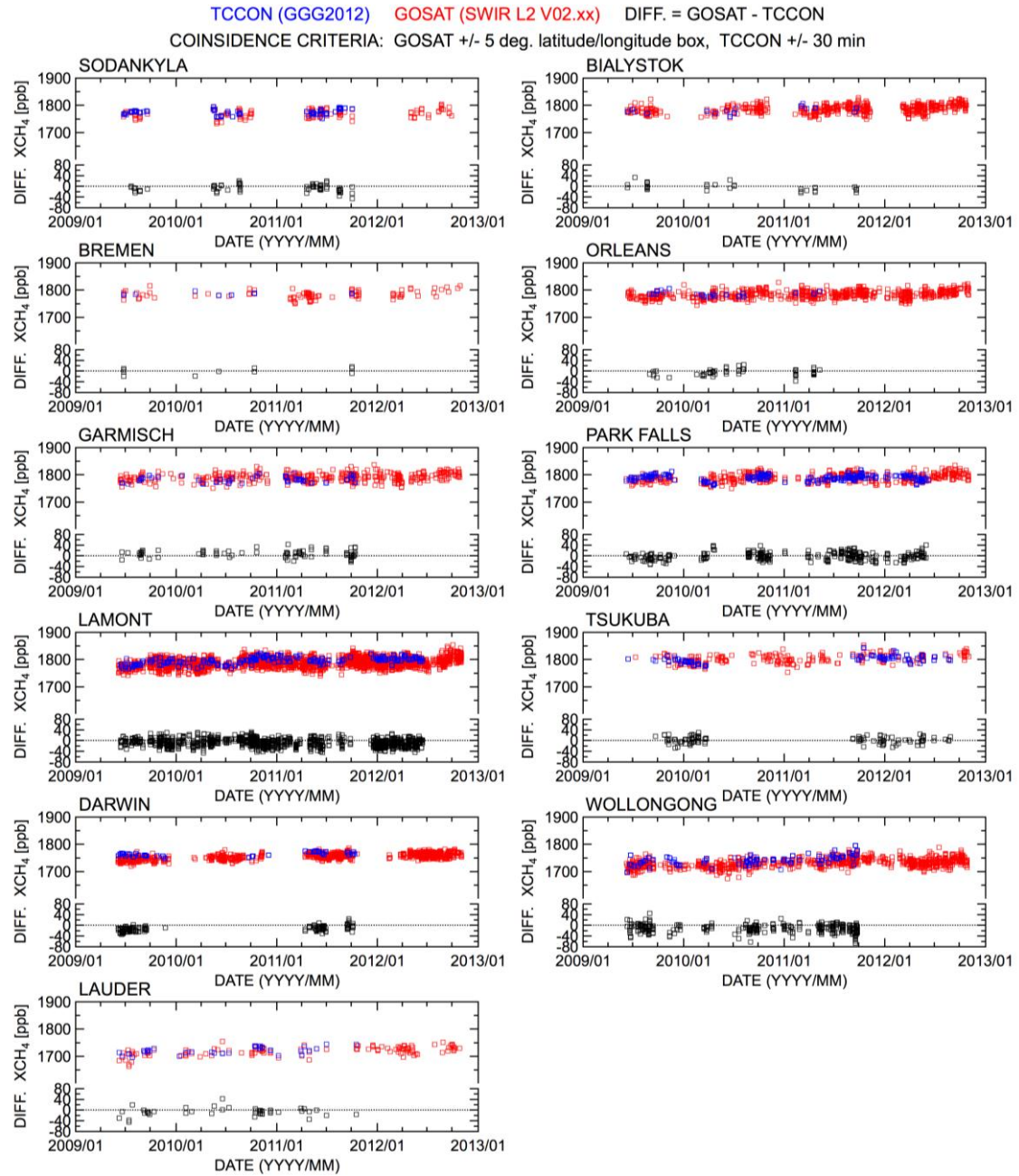
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2 Figure 8. Difference between the SWIR L2 V02.xx and TCCON data (GGG2012) as a
3 function of (a, b) retrieved surface pressure, (c, d) retrieved surface albedo, (e, f)
4 retrieved AOD, and (g, h) time for XCO₂ and XCH₄, respectively. Only the matched
5 data until July 2010 are used. Red dots are the individual results and the average and
6 standard deviation are shown in blue square and vertical bars. Gray histograms show
7 the number of data contains within each bin.



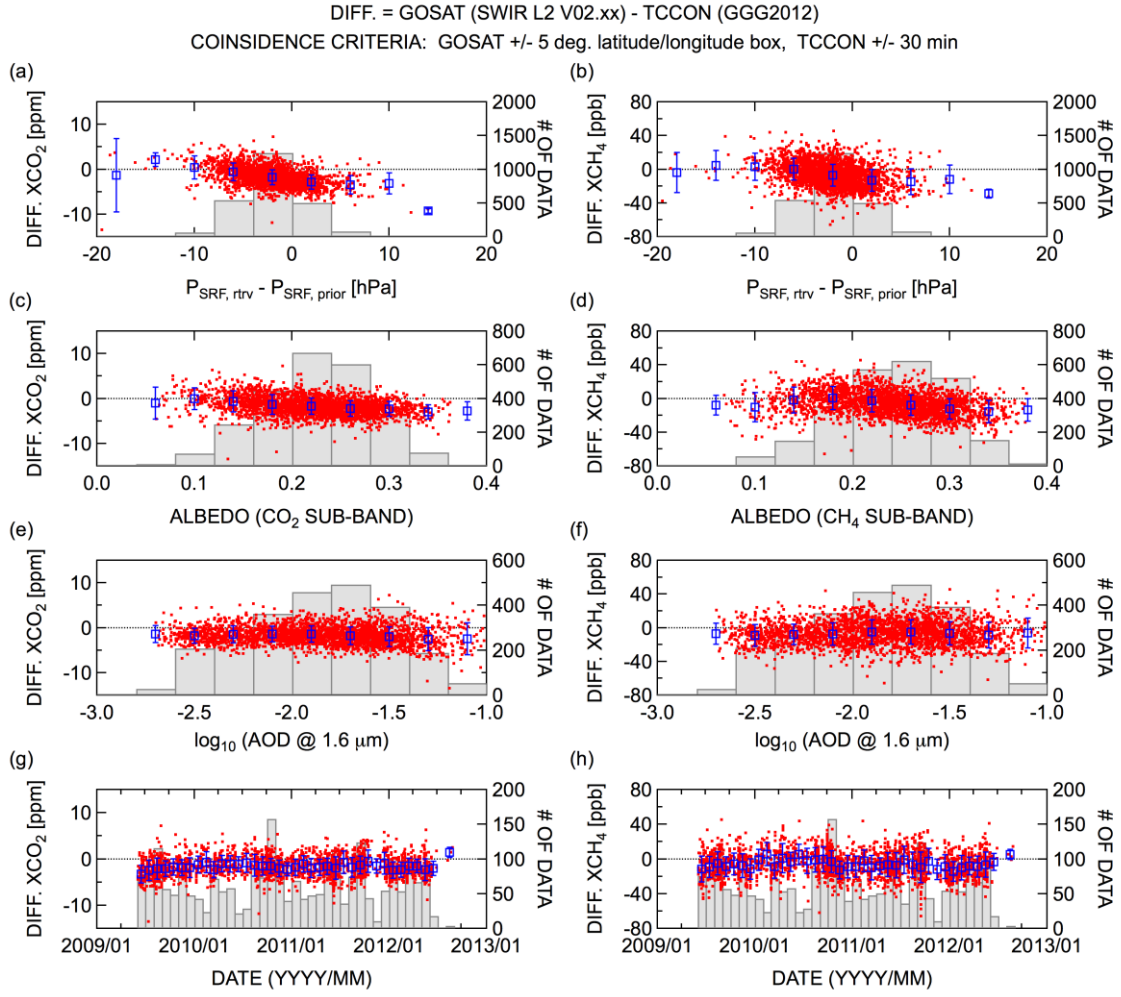
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2 Figure 9. Time series of the SWIR L2 V02.xx and TCCON XCO₂ (GGG2012) and their
 3 difference for each TCCON site. All available data are used. The GOSAT data are
 4 retrieved within ± 5 degrees latitude/longitude box centered at each TCCON site and
 5 TCCON data are the mean values measured within ± 30 min of GOSAT overpass time.



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2 Figure 10. Time series of the SWIR L2 V02.xx and TCCON XCH₄ (GGG2012) and
 3 their difference for each TCCON site. All available data are used. The GOSAT data
 4 are retrieved within ± 5 degrees latitude/longitude box centered at each TCCON site and
 5 TCCON data are the mean values measured within ± 30 min of GOSAT overpass time.



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2 Figure 11. Difference between the SWIR L2 V02.xx and TCCON data (GGG2012) as a
3 function of (a, b) retrieved surface pressure, (c, d) retrieved surface albedo, (e, f)
4 retrieved AOD, and (g, h) time for XCO₂ and XCH₄, respectively. All available data are
5 used. Red dots are the individual results and the average and standard deviation are
6 shown in blue square and vertical bars. Gray histograms show the number of data
7 contains within each bin.

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