

Probing the potential spuriousness of observed downwelling radiative fluxes over the global Tropical Oceans

Venugopal Thandlam*, Teena Davis, Venkatramana Kaagita, Anna Rutgersson and Hasibur Rahaman

*Corresponding author email:

Supplementary material

Figures:

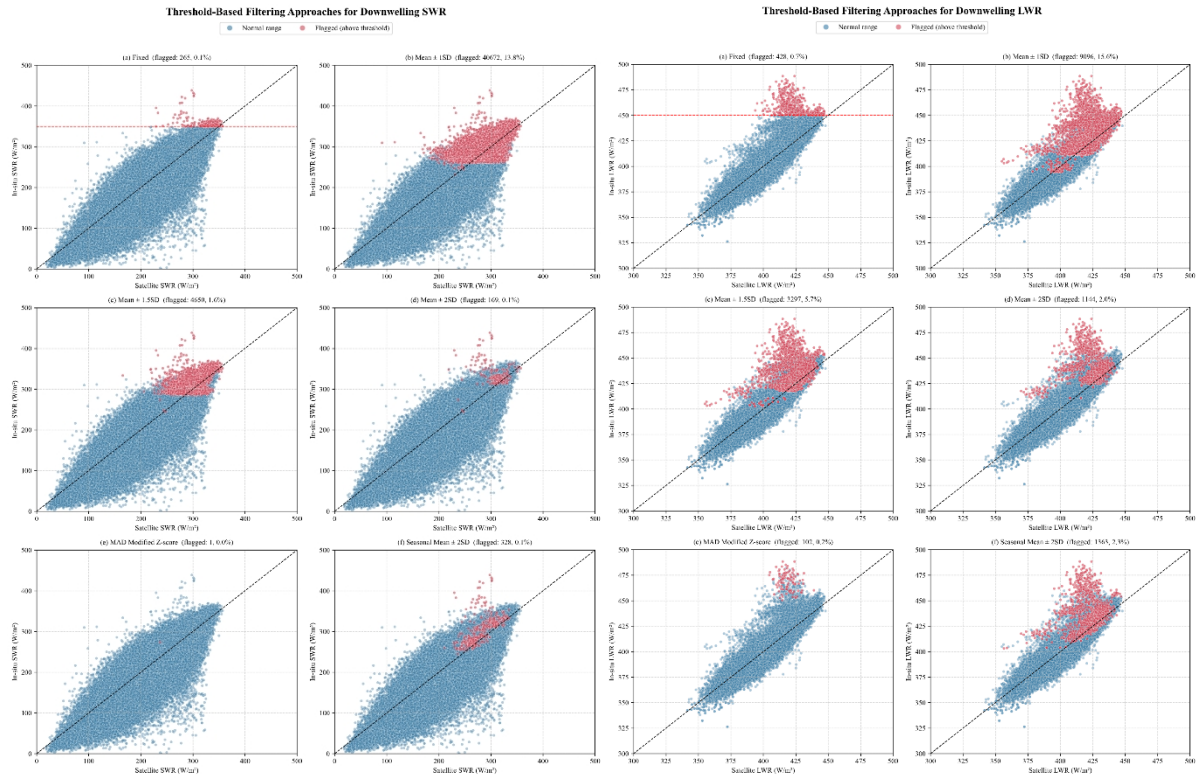


Figure S1: Sensitivity test using fixed and alternative dynamic thresholding (mean $\pm$ 2SD, mean $\pm$ 1 SD, and mean $\pm$ 1.5 SD) for station-specific filtering.

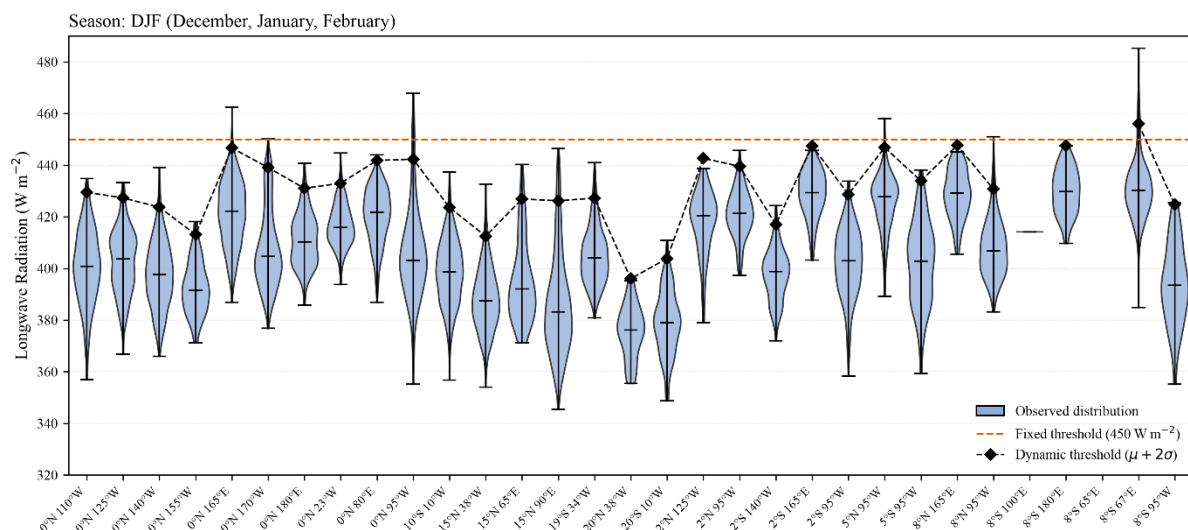


Figure S2: DJF station-wise Q_L distribution and threshold comparison

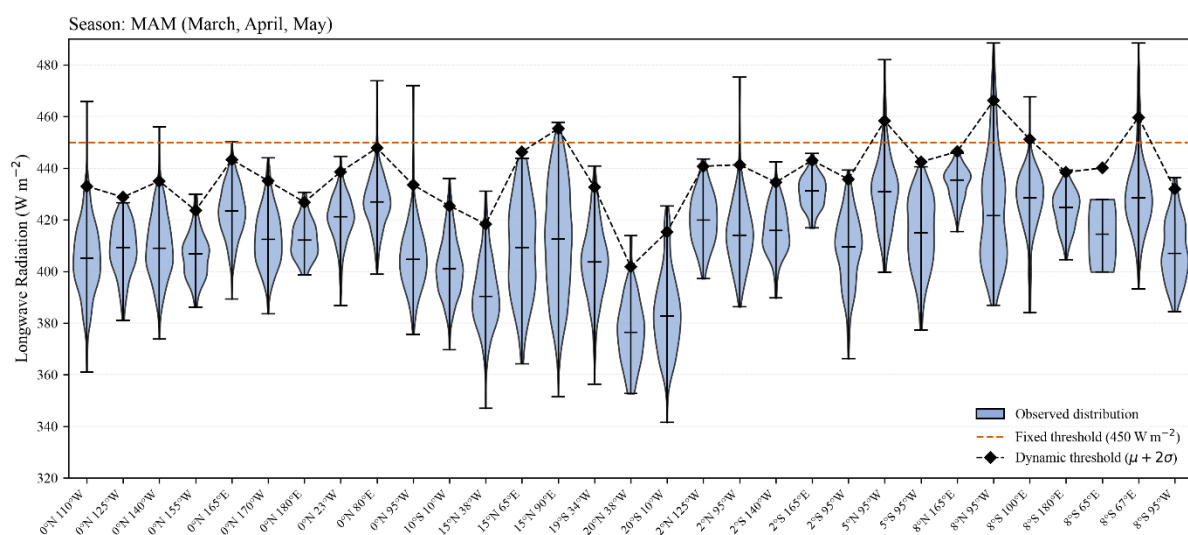


Figure S3: MAM station-wise Q_L distribution and threshold comparison

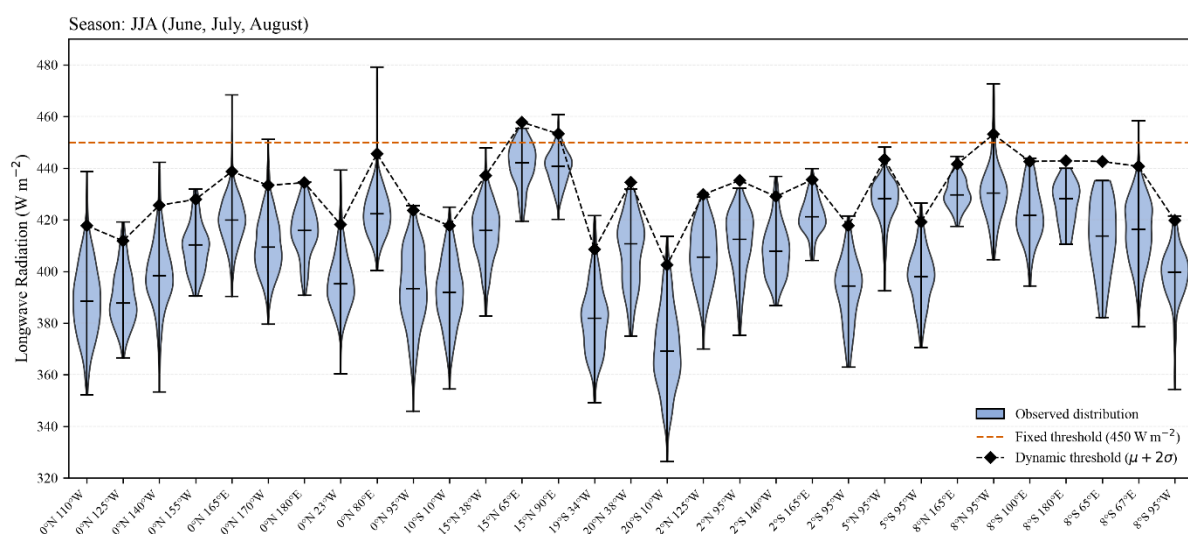


Figure S4: JJA station-wise Q_L distribution and threshold comparison

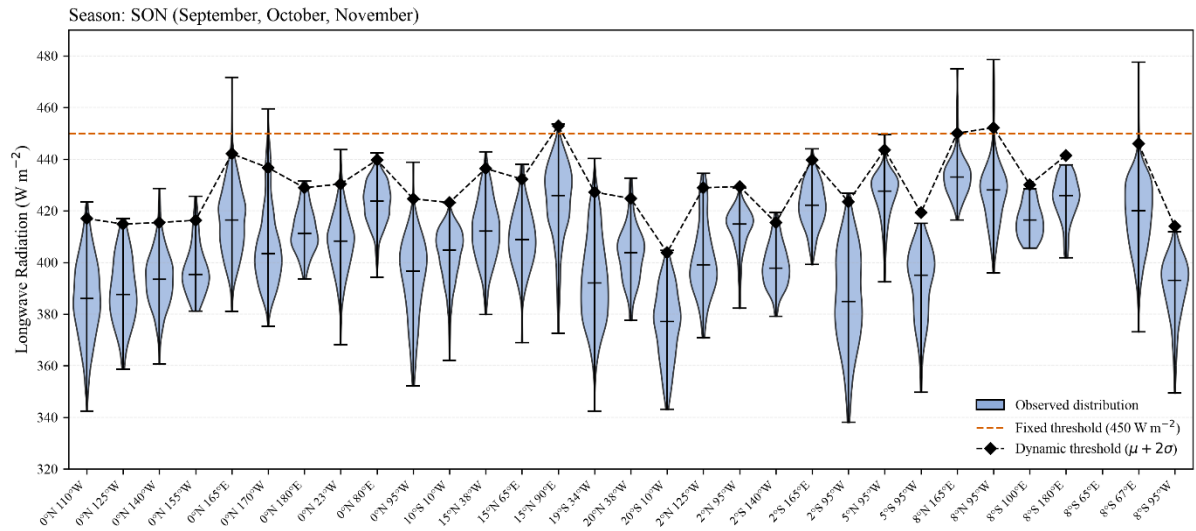


Figure S5: SON station-wise Q_L distribution and threshold comparison

Tables:

Table S1: Performance comparison of threshold-based filtering approaches for Q_s and Q_L

Radiation Type	Filtering Approach	Flagged / Removed Values	MBE (W m^{-2})	RMSE (W m^{-2})	CC
Q_s	Baseline (Unfiltered)	0	2.47	25.93	0.89
Q_s	Fixed Threshold (350 W m^{-2})	265	2.50	25.91	0.89
Q_s	Dynamic (Mean ± 1 SD)	40,694	5.18	26.56	0.87
Q_s	Dynamic (Mean ± 1.5 SD)	4,658	2.90	25.89	0.89
Q_s	Dynamic (Mean ± 2 SD)	169	2.52	25.89	0.89
Q_L	Baseline (Unfiltered)	0	-1.16	7.53	0.86
Q_L	Fixed Threshold (450 W m^{-2})	158	1.84	22.98	0.89
Q_L	Dynamic (Mean ± 1 SD)	9,104	-0.10	6.48	0.86
Q_L	Dynamic (Mean ± 1.5 SD)	3,298	-0.55	6.62	0.88
Q_L	Dynamic (Mean ± 2 SD)	1,147	-0.82	6.85	0.88

Table S2: Summary of buoy records and filtering statistics for shortwave and longwave radiation over different regions

Buoy	Shortwave					Longwave				
	Total Records	Invalid_Records_Fixed	Invalid_Records_Dynamic	Fixed_Filtered_Percentage	Dynamic_Filtered_Percentage	Total Records	Invalid_Records_Fixed	Invalid_Records_Dynamic	Fixed_Filtered_Percentage	Dynamic_Filtered_Percentage
PIRATA	20721	0	294	0	1.42	20721	0	294	0	1.42
RAMA	12054	293	194	2.43	1.61	12054	293	194	2.43	1.61
TRITON	25369	135	659	0.53	2.6	25369	135	659	0.53	2.6

Table S3: Details of stations and magnitudes of Q_s where the mean + 2 SD value for each station exceeds the threshold, resulting in the removal of those readings

Q_s					
Latitude	Longitude	Mean+2SD	Latitude	Longitude	Mean+2SD
-20	350	342.07	-8	165	344.81
-19	326	377.51	-8	180	347.46
-14	328	369.91	-8	265	336.90
-10	350	343.02	-5	156	342.85
-8	330	358.84	-5	165	341.74
-6	350	326.24	-5	265	346.57
-5	350	379.18	-2	156	354.91
0	0	316.74	-2	165	351.69
0	325	359.18	-2	220	337.24
0	337	340.15	-2	265	345.92
0	350	323.38	0	147	353.43
0	357	318.35	0	156	358.33
4	322	350.19	0	165	356.62
4	337	333.53	0	180	323.55
8	322	333.30	0	190	348.94
12	322	317.87	0	205	329.62
12	337	311.86	0	220	334.51
15	322	325.31	0	235	340.87
20	322	346.87	0	250	338.71
21	337	311.55	0	265	339.49

-12	55	364.81	2	137	348.80
-12	65	244.57	2	147	347.06
-12	67	369.31	2	156	347.71
-12	80.5	363.41	2	165	348.43
-12	93	363.13	2	220	347.35
-8	55	364.23	2	235	329.50
-8	65	281.16	2	265	329.56
-8	67	364.24	5	137	347.90
-8	80.5	371.69	5	147	348.88
-8	95	352.32	5	156	340.00
-8	100	340.20	5	165	337.77
-5	95	346.23	5	265	323.64
-4	57	362.01	8	137	344.42
-4	65	316.89	8	156	344.07
-4	67	372.24	8	165	337.19
-4	80.5	367.20	8	190	328.07
-1.5	67	369.75	8	265	359.37
-1.5	80.5	368.79	4	90	357.20
0	67	367.82	8	67	355.49
0	80.5	369.85	8	90	351.87
0	90	364.04	12	90	350.20
1.5	67	362.57	15	65	325.39
4	67	362.76	15	90	347.87

Table S4: Details of stations and magnitudes of Q_L , for which the mean + 2 SD value for each station, above which filtering is applied.

Q_L					
Latitude	Longitude	Mean+2SD	Latitude	Longitude	Mean+2SD
-20	350	414.38	-8	180	443.19
-19	326	429.90	-8	265	426.55
-10	350	424.11	-5	265	434.68
0	337	437.87	-2	165	442.96
12	337	440.46	-2	220	430.91
15	322	435.98	-2	265	432.20
20	322	432.58	0	165	443.64
-8	65	441.94	0	180	430.59
67	65	453.93	0	190	436.87

100	65	446.64	0	205	424.96
0	80.5	443.88	0	220	427.50
15	65	461.69	0	235	426.09
90	65	466.07	0	250	428.38
5	265	449.12	0	265	433.66
8	165	447.35	2	235	440.15
8	265	456.94	2	265	438.10

Table S5: Fixed Thresholding Statistics for PIRATA Qs

PIRATA Qs with Fixed Threshold									
Station Location		Before Spurious Data Filtering			After Fixed Threshold Filtering			Bias Difference	RMSE Difference
LAT	LON	MBE	RMSE	Correlation	MBE	RMSE	Correlation		
-20	350	-1.633	19.511	0.946	-1.763	19.545	0.944	-0.130	0.030
15	322	-11.137	25.210	0.878	-11.137	25.210	0.878	0.000	0.000
12	337	-23.294	40.237	0.762	-23.294	40.237	0.762	0.000	0.000
12	322	-15.101	30.560	0.842	-15.101	30.560	0.842	0.000	0.000
8	322	-7.998	29.060	0.889	-7.998	29.060	0.889	0.000	0.000
4	337	-6.425	30.947	0.895	-6.425	30.947	0.895	0.000	0.000
4	322	-2.260	27.248	0.920	-2.260	27.248	0.920	0.000	0.000
0	357	-8.993	28.914	0.822	-8.993	28.914	0.822	0.000	0.000
0	350	-5.753	22.307	0.870	-5.753	22.307	0.870	0.000	0.000
0	337	1.348	20.107	0.890	1.348	20.107	0.890	0.000	0.000
0	325	1.759	24.545	0.904	1.759	24.545	0.904	0.000	0.000
20	322	-3.909	18.928	0.939	-3.914	18.928	0.939	0.000	0.000
0	0	-7.384	26.450	0.878	-7.384	26.450	0.878	0.000	0.000
-5	350	8.785	25.861	0.944	8.785	25.861	0.944	0.000	0.000
-6	350	-5.440	21.326	0.884	-5.440	21.326	0.884	0.000	0.000
-8	330	-2.123	19.940	0.916	-2.123	19.940	0.916	0.000	0.000
21	337	-27.269	37.099	0.870	-27.269	37.099	0.870	0.000	0.000
-10	350	-2.050	19.997	0.934	-2.050	19.997	0.934	0.000	0.000
-19	326	-3.492	23.114	0.946	-4.051	23.152	0.942	-0.560	0.040
-14	328	-1.935	22.610	0.912	-2.201	22.501	0.911	-0.270	-0.110

Table S6: Fixed Thresholding Statistics for RAMA Qs

RAMA Qs with Fixed Threshold				
Station Location	Before Spurious Data		After Fixed Threshold	Bias RMSE

		Filtering			Filtering			Differe nce	Differe nce
LAT	LON	MBE	RMSE	Correla tion	MBE	RMSE	Correla tion		
0	80	0.75	26.48	0.93	0.75	26.48	0.93	0.00	0.00
4	67	-1.69	23.95	0.93	-1.69	23.95	0.93	0.00	0.00
-8	67	-3.70	32.63	0.88	-3.70	32.63	0.88	0.00	0.00
8	90	2.55	30.45	0.89	2.55	30.45	0.89	0.00	0.00
8	67	0.39	20.52	0.95	0.39	20.52	0.95	0.00	0.00
-8	65	5.03	14.91	0.92	5.03	14.91	0.92	0.00	0.00
-8	55	-6.41	35.09	0.85	-6.41	35.09	0.85	0.00	0.00
-12	93	1.03	26.48	0.92	1.01	26.48	0.92	-0.02	0.00
1	67	-3.73	23.42	0.93	-3.73	23.42	0.93	0.00	0.00
-12	67	-0.12	26.74	0.91	-0.29	26.65	0.91	-0.17	-0.09
-12	80	-3.92	25.15	0.93	-3.95	25.15	0.93	-0.03	0.00
4	90	3.95	27.18	0.93	3.95	27.18	0.93	0.00	0.00
0	67	-0.82	26.72	0.91	-0.82	26.72	0.91	0.00	0.00
-8	80	-1.67	24.90	0.94	-1.67	24.90	0.94	0.00	0.00
0	90	3.61	26.42	0.93	3.61	26.42	0.93	0.00	0.00
-1	67	-0.55	24.11	0.93	-0.55	24.11	0.93	0.00	0.00
-8	100	7.87	31.16	0.89	7.60	30.66	0.89	-0.27	-0.49
-12	65	-3.76	11.66	0.77	-3.76	11.66	0.77	0.00	0.00
12	90	-0.46	28.42	0.90	-0.46	28.42	0.90	0.00	0.00
-5	95	-8.39	32.25	0.90	-8.41	32.24	0.90	-0.02	-0.02
15	90	-3.96	22.81	0.94	-3.96	22.81	0.94	0.00	0.00
-12	55	0.29	23.71	0.93	0.24	23.71	0.93	-0.05	0.00
15	65	-23.98	40.99	0.81	-23.98	40.99	0.81	0.00	0.00
-4	80	-1.37	28.20	0.92	-1.37	28.20	0.92	0.00	0.00
-4	67	-2.68	33.83	0.88	-2.68	33.83	0.88	0.00	0.00
-8	95	-6.40	32.76	0.88	-6.40	32.76	0.88	0.00	0.00
-1	80	-1.04	22.46	0.95	-1.04	22.46	0.95	0.00	0.00
-4	65	1.52	28.42	0.90	1.52	28.42	0.90	0.00	0.00
-4	57	-9.58	28.06	0.91	-9.58	28.06	0.91	0.00	0.00

Table S7: Fixed Thresholding Statistics for TRITON Qs

TRITON Qs with Fixed Threshold									
Station Location		Before Spurious Data Filtering			After Fixed Threshold Filtering			Bias Differe nce	RMSE Differe nce
LAT	LON	MBE	RMSE	Correla	MBE	RMSE	Correla		

				tion			tion		
5	137	-4.301	30.778	0.891	-4.326	30.733	0.891	-0.020	-0.050
5	147	0.238	29.862	0.908	0.238	29.862	0.908	0.000	0.000
5	165	-1.451	25.644	0.915	-1.451	25.644	0.915	0.000	0.000
5	265	-4.540	34.250	0.852	-4.540	34.250	0.852	0.000	0.000
8	137	-6.378	32.035	0.883	-6.418	31.956	0.883	-0.040	-0.080
8	156	-0.514	28.480	0.894	-0.514	28.480	0.894	0.000	0.000
8	165	0.198	25.021	0.904	0.198	25.021	0.904	0.000	0.000
8	190	4.400	30.942	0.880	4.400	30.942	0.880	0.000	0.000
8	265	-4.343	37.714	0.857	-4.343	37.714	0.857	0.000	0.000
5	156	-4.841	30.131	0.899	-4.884	30.073	0.899	-0.040	-0.060
2	265	-0.195	25.866	0.891	-0.195	25.866	0.891	0.000	0.000
-8	265	1.535	20.464	0.921	1.535	20.464	0.921	0.000	0.000
2	220	12.050	19.475	0.894	12.05	19.475	0.894	0.000	0.000
-8	165	-0.604	28.461	0.910	-0.633	28.436	0.910	-0.030	-0.020
-5	156	-1.759	31.843	0.889	-1.759	31.843	0.889	0.000	0.000
-5	165	-1.608	24.921	0.916	-1.608	24.921	0.916	0.000	0.000
-5	265	1.301	26.121	0.898	1.301	26.121	0.898	0.000	0.000
-2	156	-0.615	30.208	0.893	-0.732	29.976	0.894	-0.120	-0.230
-2	165	-2.224	25.417	0.913	-2.224	25.417	0.913	0.000	0.000
-2	220	-2.057	15.748	0.867	-2.057	15.748	0.867	0.000	0.000
-2	265	6.062	23.576	0.868	6.062	23.576	0.868	0.000	0.000
0	147	-0.449	30.583	0.895	-0.481	30.544	0.895	-0.030	-0.040
0	156	1.105	27.945	0.902	0.907	27.566	0.903	-0.200	-0.380
2	235	-4.758	16.198	0.909	-4.758	16.198	0.909	0.000	0.000
0	165	-0.427	21.875	0.922	-0.427	21.875	0.922	0.000	0.000
0	205	-1.289	10.779	0.903	-1.289	10.779	0.903	0.000	0.000
0	220	0.500	14.666	0.838	0.491	14.651	0.838	-0.010	-0.020
0	235	3.578	17.820	0.820	3.578	17.820	0.820	0.000	0.000
0	250	-1.287	21.023	0.844	-1.287	21.023	0.844	0.000	0.000
0	265	0.008	24.726	0.850	0.008	24.726	0.850	0.000	0.000
-8	180	-5.012	24.072	0.913	-5.012	24.072	0.913	0.000	0.000
2	137	-5.414	35.145	0.847	-5.474	35.090	0.847	-0.060	-0.050
2	147	-1.860	29.511	0.897	-1.881	29.475	0.897	-0.020	-0.040
2	156	-3.662	28.617	0.899	-3.703	28.540	0.899	-0.040	-0.080
2	165	1.942	24.392	0.911	1.942	24.392	0.911	0.000	0.000
0	190	-2.957	20.243	0.871	-2.967	20.230	0.871	-0.010	-0.010

0	180	-1.416	11.438	0.882	-1.416	11.438	0.882	0.000	0.000
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Table S8: Fixed Thresholding Statistics for PIRATA Q_L

PIRATA Q _L with Fixed Threshold									
Station Location		Before Spurious Data Filtering			After Fixed Threshold Filtering (≤450W/m ²)			Bias Differenc e	RMSE Differenc e
LAT	LON	MBE	RMSE	Correlatio n	MBE	RMSE	Correlatio n		
-20	350	-2.966	10.341	0.792	-2.966	10.341	0.792	0.000	0.000
0	337	1.339	5.800	0.913	1.339	5.800	0.913	0.000	0.000
15	322	1.119	5.802	0.943	1.119	5.802	0.943	0.000	0.000
20	322	-4.305	6.659	0.963	-4.305	6.659	0.963	0.000	0.000
-19	326	0.782	6.522	0.925	0.782	6.522	0.925	0.000	0.000
-10	350	-3.889	6.973	0.897	-3.889	6.973	0.897	0.000	0.000

Table S9: Fixed Thresholding Statistics for RAMA Q_L

RAMA Q _L with Fixed Threshold									
Station Location		Before Spurious Data Filtering			After Fixed Threshold Filtering			Bias Differenc e	RMSE Differenc e
LAT	LON	MBE	RMSE	Correlatio n	MBE	RMSE	Correlatio n		
-8	67	6.300	12.664	0.676	4.573	8.509	0.823	-1.727	-4.155
-8	100	7.373	13.961	0.432	7.204	13.589	0.450	-0.169	-0.372
15	90	3.910	7.429	0.970	3.764	7.309	0.970	-0.146	-0.120
15	65	7.833	11.229	0.935	7.535	11.019	0.932	-0.298	-0.211
0	80	3.466	7.551	0.754	3.046	5.934	0.842	-0.421	-1.616
-8	65	-0.532	4.889	0.952	-0.532	4.889	0.952	0.000	0.000

Table S10: Fixed Thresholding Statistics for TRITON Q_L

TRITON Q _L with Fixed Threshold									
Station Location		Before Spurious Data Filtering			After Fixed Threshold Filtering			Bias Differenc e	RMSE Differenc e
LAT	LON	MBE	RMSE	Correlatio n	MBE	RMSE	Correlatio n		
8	265	3.847	12.738	0.713	1.631	7.962	0.840	-2.215	-4.776
8	165	6.136	8.516	0.655	5.648	7.082	0.792	-0.488	-1.433
5	265	2.197	8.448	0.653	1.474	6.600	0.745	-0.723	-1.848
2	265	-3.764	7.766	0.809	-3.966	7.212	0.839	-0.202	-0.554
2	235	2.930	5.364	0.952	2.930	5.364	0.952	0.000	0.000
0	265	-1.653	9.545	0.828	-2.165	8.415	0.851	-0.512	-1.131

0	250	-1.804	6.636	0.923	-1.821	6.577	0.924	-0.018	-0.059
0	220	1.698	7.766	0.844	1.669	7.693	0.846	-0.029	-0.074
0	205	0.557	4.323	0.930	0.557	4.323	0.930	0.000	0.000
0	180	3.663	4.793	0.937	3.663	4.793	0.937	0.000	0.000
0	165	0.748	5.745	0.875	0.634	5.360	0.888	-0.114	-0.385
-2	265	-0.906	6.472	0.919	-0.906	6.472	0.919	0.000	0.000
-2	220	5.496	6.703	0.950	5.496	6.703	0.950	0.000	0.000
-2	165	-0.668	5.423	0.811	-0.668	5.423	0.811	0.000	0.000
-5	265	-4.609	7.222	0.936	-4.609	7.222	0.936	0.000	0.000
-8	265	-5.843	7.969	0.927	-5.843	7.969	0.927	0.000	0.000
-8	180	3.487	5.015	0.913	3.487	5.015	0.913	0.000	0.000
0	235	3.013	5.644	0.944	3.013	5.644	0.944	0.000	0.000
0	190	1.115	7.382	0.851	1.073	7.296	0.853	-0.043	-0.085

Table S11: Dynamic Thresholding Statistics for PIRATA Qs

PIRATA Qs with Dynamic Threshold										
Station Location		Threshold (mean+2 SD)	Before Spurious Data Filtering			After Dynamic Threshold Filtering			Bias Difference	RMSE Difference
LAT	LON		MBE	RMSE	Correlation	MBE	RMSE	Correlation		
-20	350	341.977	-1.633	19.511	0.946	-1.935	19.466	0.942	-0.302	-0.044
15	322	325.302	-11.137	25.210	0.878	-11.249	25.211	0.878	-0.112	0.001
12	337	311.855	-23.294	40.237	0.762	-23.309	40.247	0.761	-0.016	0.010
12	322	317.862	-15.101	30.560	0.842	-15.113	30.564	0.842	-0.012	0.004
8	322	333.285	-7.998	29.060	0.889	-8.009	29.052	0.889	-0.011	-0.008
4	337	333.515	-6.425	30.947	0.895	-6.425	30.947	0.895	0.000	0.000
4	322	350.182	-2.260	27.248	0.920	-2.260	27.248	0.920	0.000	0.000
0	357	318.272	-8.993	28.914	0.822	-8.993	28.914	0.822	0.000	0.000
0	350	323.376	-5.753	22.307	0.870	-5.765	22.288	0.870	-0.012	-0.019
0	337	340.144	1.348	20.107	0.890	1.348	20.107	0.890	0.000	0.000
0	325	359.174	1.759	24.545	0.904	1.759	24.545	0.904	0.000	0.000
20	322	346.856	-3.909	18.928	0.939	-3.940	18.915	0.939	-0.031	-0.013
0	0	316.728	-7.384	26.450	0.878	-7.389	26.451	0.878	-0.005	0.001
-5	350	374.926	8.785	25.861	0.944	8.785	25.861	0.944	0.000	0.000
-6	350	326.235	-5.440	21.326	0.884	-5.466	21.302	0.884	-0.025	-0.025
-8	330	358.829	-2.123	19.940	0.916	-2.123	19.940	0.916	0.000	0.000
21	337	311.543	-27.269	37.099	0.870	-27.631	37.284	0.867	-0.363	0.185
-10	350	343.009	-2.050	19.997	0.934	-2.058	19.995	0.934	-0.008	-0.003

-19	326	377.496	-3.492	23.114	0.946	-3.492	23.114	0.946	0.000	0.000
-14	328	369.899	-1.935	22.610	0.912	-1.935	22.610	0.912	0.000	0.000
0	80	369.826	0.747	26.485	0.927	0.747	26.485	0.927	0.000	0.000

Table S12: Dynamic Thresholding Statistics for RAMA Qs

RAMA Qs with Dynamic Threshold										
Station Location		Threshold (mean+2 SD)	Before Spurious Data Filtering			After Dynamic Threshold Filtering			Bias Differen ce	RMSE Differen ce
LAT	LON		MBE	RMSE	Correlati on	MBE	RMSE	Correlati on		
0	80	369.826	0.747	26.485	0.927	0.747	26.485	0.927	0.000	0.000
4	67	362.708	-1.690	23.952	0.931	-1.690	23.952	0.931	0.000	0.000
-8	67	364.222	-3.704	32.629	0.884	-3.704	32.629	0.884	0.000	0.000
8	90	351.853	2.553	30.452	0.891	2.553	30.452	0.891	0.000	0.000
8	67	355.398	0.392	20.522	0.947	0.392	20.522	0.947	0.000	0.000
-8	65	280.071	5.033	14.906	0.920	5.033	14.906	0.920	0.000	0.000
-8	55	364.208	-6.411	35.086	0.851	-6.411	35.086	0.851	0.000	0.000
-12	93	363.080	1.027	26.482	0.919	1.027	26.482	0.919	0.000	0.000
1	67	362.536	-3.727	23.424	0.929	-3.727	23.424	0.929	0.000	0.000
-12	67	369.290	-0.118	26.737	0.908	-0.145	26.687	0.908	-0.027	-0.050
-12	80	363.388	-3.919	25.151	0.932	-3.919	25.151	0.932	0.000	0.000
4	90	357.164	3.946	27.176	0.928	3.946	27.176	0.928	0.000	0.000
0	67	367.800	-0.823	26.719	0.910	-0.823	26.719	0.910	0.000	0.000
-8	80	371.668	-1.668	24.896	0.942	-1.668	24.896	0.942	0.000	0.000
0	90	364.024	3.606	26.423	0.933	3.606	26.423	0.933	0.000	0.000
-1	67	369.729	-0.553	24.109	0.932	-0.553	24.109	0.932	0.000	0.000
-8	100	340.030	7.870	31.155	0.890	7.600	30.661	0.891	-0.271	-0.495
-12	65	244.123	-3.756	11.658	0.767	-5.136	10.402	0.718	-1.380	-1.256
12	90	350.185	-0.458	28.417	0.903	-0.458	28.417	0.903	0.000	0.000
-5	95	346.209	-8.392	32.255	0.899	-8.413	32.235	0.899	-0.020	-0.020
15	90	347.853	-3.962	22.811	0.941	-3.962	22.811	0.941	0.000	0.000
-12	55	364.775	0.288	23.712	0.927	0.288	23.712	0.927	0.000	0.000
15	65	325.245	-23.983	40.991	0.814	-24.616	40.981	0.814	-0.633	-0.010
-4	80	367.178	-1.373	28.204	0.921	-1.373	28.204	0.921	0.000	0.000
-4	67	372.215	-2.678	33.832	0.881	-2.678	33.832	0.881	0.000	0.000
-8	95	352.302	-6.398	32.762	0.879	-6.398	32.762	0.879	0.000	0.000
-1	80	368.760	-1.043	22.463	0.946	-1.043	22.463	0.946	0.000	0.000
-4	65	314.607	1.524	28.417	0.904	1.524	28.417	0.904	0.000	0.000

-4	57	361.952	-9.576	28.063	0.915	-9.576	28.063	0.915	0.000	0.000
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Table S13: Dynamic Threshold Statistics for TRITON Qs

TRITON Qs with Dynamic Threshold										
Station Location		Threshold (mean+2SD)	Before Spurious Data Filtering			After Dynamic Threshold Filtering			Bias Differ ence	RMSE Differe nce
LAT	LON		MBE	RMSE	Correla tion	MBE	RMSE	Correla tion		
5	137	347.887	-4.301	30.778	0.891	-4.326	30.733	0.891	-0.025	-0.045
5	147	348.867	0.238	29.862	0.908	0.238	29.862	0.908	0.000	0.000
5	165	337.739	-1.451	25.644	0.915	-1.451	25.644	0.915	0.000	0.000
5	265	323.579	-4.540	34.250	0.852	-4.540	34.250	0.852	0.000	0.000
8	137	344.407	-6.378	32.035	0.883	-6.428	31.949	0.883	-0.050	-0.086
8	156	344.058	-0.514	28.480	0.894	-0.514	28.480	0.894	0.000	0.000
8	165	337.171	0.198	25.021	0.904	0.198	25.021	0.904	0.000	0.000
8	190	325.942	4.400	30.942	0.880	4.400	30.942	0.880	0.000	0.000
8	265	359.315	-4.343	37.714	0.857	-4.343	37.714	0.857	0.000	0.000
5	156	339.983	-4.841	30.131	0.899	-4.884	30.073	0.899	-0.042	-0.059
2	265	329.493	-0.195	25.866	0.891	-0.195	25.866	0.891	0.000	0.000
-8	265	336.840	1.535	20.464	0.921	1.519	20.469	0.921	-0.017	0.005
2	220	347.249	12.050	19.475	0.894	12.050	19.475	0.894	0.000	0.000
-8	165	344.775	-0.604	28.461	0.910	-0.633	28.436	0.910	-0.029	-0.024
-5	156	342.835	-1.759	31.843	0.889	-1.784	31.796	0.890	-0.025	-0.047
-5	165	341.713	-1.608	24.921	0.916	-1.608	24.921	0.916	0.000	0.000
-5	265	346.505	1.301	26.121	0.898	1.301	26.121	0.898	0.000	0.000
-2	156	354.899	-0.615	30.208	0.893	-0.709	30.019	0.894	-0.094	-0.188
-2	165	351.665	-2.224	25.417	0.913	-2.224	25.417	0.913	0.000	0.000
-2	220	337.191	-2.057	15.748	0.867	-2.139	15.644	0.868	-0.082	-0.104
-2	265	345.876	6.062	23.576	0.868	5.985	23.435	0.869	-0.077	-0.141
0	147	353.418	-0.449	30.583	0.895	-0.481	30.544	0.895	-0.032	-0.039
0	156	358.322	1.105	27.945	0.902	0.933	27.606	0.903	-0.172	-0.340
2	235	329.407	-4.758	16.198	0.909	-4.758	16.198	0.909	0.000	0.000
0	165	356.609	-0.427	21.875	0.922	-0.427	21.875	0.922	0.000	0.000
0	205	329.549	-1.289	10.779	0.903	-1.289	10.779	0.903	0.000	0.000
0	220	334.503	0.500	14.666	0.838	0.488	14.650	0.838	-0.012	-0.016
0	235	340.868	3.578	17.820	0.820	3.578	17.820	0.820	0.000	0.000
0	250	338.698	-1.287	21.023	0.844	-1.296	21.016	0.844	-0.009	-0.007
0	265	339.446	0.008	24.726	0.850	0.008	24.726	0.850	0.000	0.000

-8	180	347.271	-5.012	24.072	0.913	-5.012	24.072	0.913	0.000	0.000
2	137	348.787	-5.414	35.145	0.847	-5.474	35.090	0.847	-0.060	-0.055
2	147	347.045	-1.860	29.511	0.897	-1.881	29.475	0.897	-0.021	-0.036
2	156	347.701	-3.662	28.617	0.899	-3.703	28.540	0.899	-0.041	-0.077
2	165	348.396	1.942	24.392	0.911	1.942	24.392	0.911	0.000	0.000
0	190	348.930	-2.957	20.243	0.871	-2.967	20.230	0.871	-0.011	-0.013
0	180	323.483	-1.416	11.438	0.882	-1.416	11.438	0.882	0.000	0.000

Table S14: Dynamic Thresholding Statistics for PIRATA Q_L

PIRATA Q _L with Dynamic Threshold										
Station Location		Threshold (mean+2SD)	Before Spurious Data Filtering			After Dynamic Threshold Filtering			Bias Differen ce	RMSE Differen ce
LAT	LON		MBE	RMSE	Correlat ion	MBE	RMSE	Correlat ion		
-20	350	410.720	-2.966	10.341	0.792	-4.148	8.595	0.857	-1.182	-1.746
0	337	437.868	1.339	5.800	0.913	1.249	5.666	0.914	-0.090	-0.134
15	322	435.976	1.119	5.802	0.943	1.041	5.744	0.942	-0.078	-0.058
20	322	432.528	-4.305	6.659	0.963	-4.331	6.663	0.963	-0.027	0.004
-19	326	429.900	0.782	6.522	0.925	0.607	6.385	0.920	-0.175	-0.136
-10	350	424.105	-3.889	6.973	0.897	-3.978	6.985	0.892	-0.089	0.012

Table S15: Dynamic Thresholding Statistics for RAMA Q_L

RAMA Q _L with Dynamic Threshold										
Station Location		Threshold (mean+2SD)	Before Spurious Data Filtering			After Dynamic Threshold Filtering			Bias Differe nce	RMSE Differen ce
LAT	LON		MBE	RMSE	Correlat ion	MBE	RMSE	Correlat ion		
-8	67	453.92	6.30	12.66	0.68	4.82	9.06	0.80	-1.48	-3.61
-8	100	446.60	7.37	13.96	0.43	7.13	13.50	0.45	-0.25	-0.46
15	90	466.06	3.91	7.43	0.97	3.91	7.43	0.97	0.00	0.00
15	65	461.63	7.83	11.23	0.94	7.83	11.23	0.94	0.00	0.00
0	80	443.87	3.47	7.55	0.75	2.93	5.65	0.85	-0.54	-1.91
-8	65	441.52	-0.53	4.89	0.95	-0.53	4.89	0.95	0.00	0.00

Table S16: Dynamic Thresholding Statistics for TRITON Q_L

TRITON Q _L with Dynamic Threshold										
Station Location		Threshold (mean+2SD)	Before Spurious Data Filtering			After Dynamic Threshold Filtering			Bias Differe nce	RMSE Differen ce
LAT	LON		MBE	RMSE	Correlati	MBE	RMSE	Correlati		

					on			on		
8	265	456.92	3.85	12.74	0.71	2.15	8.85	0.82	-1.70	-3.89
8	165	447.34	6.14	8.52	0.65	5.65	7.08	0.79	-0.49	-1.43
5	265	449.11	2.20	8.45	0.65	1.40	6.47	0.75	-0.80	-1.98
2	265	438.08	-3.76	7.77	0.81	-4.12	7.14	0.84	-0.35	-0.63
2	235	440.12	2.93	5.36	0.95	2.90	5.35	0.95	-0.03	-0.01
0	265	433.64	-1.65	9.55	0.83	-2.73	7.42	0.88	-1.08	-2.13
0	250	428.37	-1.80	6.64	0.92	-2.02	6.39	0.92	-0.21	-0.24
0	220	427.50	1.70	7.77	0.84	1.43	7.45	0.83	-0.27	-0.32
0	205	424.93	0.56	4.32	0.93	0.48	4.32	0.92	-0.08	0.00
0	180	430.57	3.66	4.79	0.94	3.58	4.69	0.93	-0.09	-0.10
0	165	443.64	0.75	5.74	0.87	0.50	5.20	0.89	-0.25	-0.55
-2	265	432.18	-0.91	6.47	0.92	-0.99	6.47	0.92	-0.09	0.00
-2	220	430.89	5.50	6.70	0.95	5.51	6.72	0.94	0.01	0.02
-2	165	442.94	-0.67	5.42	0.81	-0.84	5.27	0.81	-0.17	-0.15
-5	265	434.66	-4.61	7.22	0.94	-4.78	7.25	0.93	-0.17	0.03
-8	265	426.53	-5.84	7.97	0.93	-5.96	8.02	0.92	-0.11	0.05
-8	180	443.16	3.49	5.02	0.91	3.38	4.88	0.91	-0.11	-0.14
0	235	426.06	3.01	5.64	0.94	2.96	5.61	0.94	-0.05	-0.03
0	190	436.87	1.12	7.38	0.85	0.35	5.92	0.88	-0.76	-1.46