

# Release information for the GERB 4 V100 dataset

E. Baudrez    C. Aebi    P. de Buyl    J. Moreels    A. Vion    N. Clerbaux

2024-05-06

Institution	Royal Meteorological Institute of Belgium
Contact email	gerb@meteo.be
Report ID	RMIB-GERB-RN-0045-V01
Report version	1
Date	2024-05-06

## Introduction

The purpose of this document is to provide accompanying information to the dataset “GERB 4 V100” released by the GERB project. It is the first public release of the GERB 4 dataset. Please note that this dataset has not yet undergone the same quality control and validation as an Edition release, but it is hoped that a timely release will benefit the user community.

The GERB 4 V100 dataset is a collection of level 2 (L2) data from the GERB 4 instrument. The notes contain important information about the data set itself and its usage.

## The GERB mission and the GERB 4 instrument

GERB stands for the Geostationary Earth Radiation Budget instrument onboard the Meteosat Second Generation series of spacecraft. GERB is a broadband radiometer with a shortwave (SW) and a totalwave (TW) channel.

The GERB 4 instrument operated at longitude 0 degree from February 2018 to February 2023.

## Dataset characteristics

The dataset can be found at the URL <https://gerb.oma.be/public/GERB/V100>

Instrument name	GERB 4
Platform	Meteosat-11
Start time	2018-02-21
End time	2023-02-14
Geographic coverage	Latitude: -80 to 80 degrees Longitude -80 to 80 degrees

## Background documents

The GERB processing, as it was carried out for the release of the Edition 1 (ED01) datasets of previous GERB instruments, is documented in several scientific publications.

The content of the files is described in detail in the *RMIB GERB Products User Guide*.

Document name	Reference or URL
<i>RMIB GERB Products User Guide</i>	<a href="https://gerb.oma.be/doku.php?id=documentation">https://gerb.oma.be/doku.php?id=documentation</a>
Comparison of GERB instantaneous radiance and flux products with CERES Edition-2 data	<a href="https://gerb.oma.be/people/gerb/gerb_ceres_comp.pdf">https://gerb.oma.be/people/gerb/gerb_ceres_comp.pdf</a>
Evaluation of the GERB-4 dataset CERES Science Team Meeting	<a href="https://ceres.larc.nasa.gov/documents/STM/2023-10/10_Clerbaux.pdf">https://ceres.larc.nasa.gov/documents/STM/2023-10/10_Clerbaux.pdf</a>

## Data availability

The production of GERB data relies on the operation of both the SEVIRI (SEV) and the GERB instrument. The production of GERB L2 data is not possible during the maintenance of one of the two instruments, during the eclipse seasons, or because of image quality considerations. During eclipse seasons (exact time periods detailed below), the GERB instrument is only operational for a few hours per day. However, the GERB-like product (based on a narrowband-to-broadband conversion of SEVIRI data) is normally available during eclipse seasons. In general, the GERB-like product is generated whenever SEVIRI data are available, independent of the production of GERB L2 data.

The available individual GERB and GERB-like data files might contain erroneous pixels which are filled with the value -32767. Reasons for such missing pixels are, for example, erroneous scans of either the GERB or the SEVIRI instrument, or saturation of SEVIRI pixels.

## Eclipse seasons

Year	Start Date	End Date	Start Date	End Date
2018	12 Feb	25 Apr	21 Aug	27 Oct
2019	18 Feb	25 Apr	20 Aug	28 Oct
2020	17 Feb	27 Apr	18 Aug	27 Oct
2021	15 Feb	25 Apr	18 Aug	27 Oct
2022	15 Feb	25 Apr	17 Aug	28 Oct
2023	13 Feb			

In those so-called eclipse seasons there are only data available between 02:15 and 06:30 UTC. During the other hours of the day the GERB instrument is switched off in order to avoid too strong a degradation of the detectors.

## GERB 4 instrument with SEVIRI 4 imager

The number of files per product type available in the V100 release are listed below.

### L15\_GEO\_SW

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	424	1643	2664	7409	7589	7754	5770	1590	2097	5301	7484
2019	6062	5023	1590	2754	7674	7569	7219	5105	1590	2395	7560	5830
2020	5248	4478	1582	910	7801	7540	5922	5145	1325	2266	1878	6766
2021	7859	4018	938	2702	7652	7463	6791	5178	1365	1942	6481	4951
2022	4892	3306	1545	1081	7163	7421	6976	4800	1372	2378	7490	7831
2023	7859	3074	0	0	0	0	0	0	0	0	0	0

### L15\_GEO\_TW

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	432	1674	2690	7414	7591	7756	5785	1620	2113	5316	7491
2019	6067	5035	1620	2779	7690	7573	7223	5121	1620	2423	7567	5837

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2020	5258	4492	1612	910	7805	7543	5925	5163	1350	2290	1886	6771
2021	7863	4037	959	2730	7658	7476	6805	5197	1393	1974	6489	4962
2022	4898	3330	1598	1099	7170	7438	6983	4818	1398	2406	7502	7835
2023	7863	3089	0	0	0	0	0	0	0	0	0	0

### L20\_ARG\_SOL

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	136	527	807	2336	2526	2581	1698	510	635	1665	2488
2019	1987	1453	510	840	2385	2519	2401	1500	510	740	2362	1938
2020	1736	1296	508	263	2446	2511	1943	1503	425	692	595	2251
2021	2585	1156	298	813	2393	2478	2243	1485	437	604	1990	1641
2022	1550	956	479	324	2255	2460	2319	1389	440	729	2262	2607
2023	2486	862	0	0	0	0	0	0	0	0	0	0

### L20\_ARG\_TH

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	136	527	804	2334	2526	2580	1694	510	635	1665	2487
2019	1985	1450	510	836	2380	2519	2400	1495	510	739	2358	1938
2020	1736	1290	508	262	2442	2511	1942	1499	425	691	593	2251
2021	2584	1152	298	809	2389	2478	2241	1479	437	604	1984	1641
2022	1547	953	479	323	2251	2458	2318	1382	440	727	2254	2606
2023	2484	856	0	0	0	0	0	0	0	0	0	0

### L20\_BARG\_SOL\_M15\_R50

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	128	496	811	2595	2849	2911	1807	480	653	1828	2794
2019	2228	1547	480	850	2605	2840	2706	1587	480	737	2607	2175
2020	1932	1370	477	285	2717	2830	2173	1590	400	688	645	2533
2021	2909	1198	273	809	2651	2761	2482	1561	407	576	2169	1822
2022	1711	973	401	302	2480	2730	2601	1465	414	721	2455	2934
2023	2768	904	0	0	0	0	0	0	0	0	0	0

### L20\_BARG\_TH\_M15\_R50

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	128	496	809	2594	2855	2913	1806	480	653	1829	2796
2019	2231	1538	480	848	2598	2842	2706	1581	480	737	2608	2176
2020	1932	1363	477	284	2714	2832	2179	1582	400	692	646	2536
2021	2908	1197	273	807	2644	2763	2488	1552	407	576	2170	1823
2022	1710	973	401	302	2479	2732	2602	1456	414	719	2453	2940
2023	2770	896	0	0	0	0	0	0	0	0	0	0

### L20\_HR\_SOL\_EUROPE

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	144	558	952	2790	2859	2921	2145	540	759	1974	2812
2019	2281	1871	540	989	2866	2850	2717	1894	540	849	2839	2189

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2020	1962	1665	537	342	2940	2840	2225	1907	450	804	691	2545
2021	2960	1477	313	961	2877	2791	2529	1913	460	668	2425	1846
2022	1832	1204	482	372	2682	2767	2617	1776	466	840	2800	2948
2023	2957	1131	0	0	0	0	0	0	0	0	0	0

### L20\_HR\_SOL\_TH

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	104	403	652	2008	2183	2231	1427	390	518	1418	2147
2019	1713	1217	390	679	2028	2180	2074	1254	390	591	2026	1670
2020	1483	1086	388	225	2105	2170	1675	1260	325	555	506	1945
2021	2236	961	225	653	2052	2127	1923	1241	333	469	1703	1407
2022	1328	785	342	249	1929	2107	1999	1160	336	580	1920	2247
2023	2138	721	0	0	0	0	0	0	0	0	0	0

### L20\_HR\_TH\_EUROPE

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	144	558	952	2790	2859	2921	2145	540	759	1974	2812
2019	2281	1871	540	989	2866	2850	2717	1894	540	849	2839	2189
2020	1962	1665	537	342	2940	2840	2225	1907	450	804	691	2545
2021	2960	1477	313	961	2877	2791	2529	1913	460	668	2425	1846
2022	1832	1204	482	372	2682	2767	2617	1776	466	840	2800	2948
2023	2957	1131	0	0	0	0	0	0	0	0	0	0

## SEVIRI 4 GERB like product

### L20\_BARG\_SOL\_M15\_R50

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	767	2974	2878	2903	2873	2931	2974	2878	2971	2875	2965
2019	2293	2683	2974	2875	2962	2878	2974	2971	2878	2968	2873	2974
2020	2291	2782	2974	2874	2974	2875	2971	2974	2878	2964	2878	2968
2021	2971	2673	2964	2858	2971	2856	2927	2951	2858	2958	2872	2831
2022	2288	2678	2964	2875	2951	2862	2963	2962	2869	2965	2875	2968
2023	2974	1915	0	0	0	0	0	0	0	0	0	0

### L20\_BARG\_TH\_M15\_R50

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	768	2976	2880	2905	2875	2933	2976	2880	2973	2877	2967
2019	2295	2685	2976	2877	2964	2880	2976	2973	2880	2970	2875	2976
2020	2293	2784	2976	2876	2976	2877	2973	2976	2880	2966	2880	2970
2021	2973	2675	2966	2860	2973	2858	2929	2953	2860	2960	2874	2833
2022	2290	2680	2966	2877	2953	2864	2965	2964	2871	2954	2877	2970
2023	2976	1916	0	0	0	0	0	0	0	0	0	0

### L20\_HR\_SOL\_TH

Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2018	0	768	2976	2880	2907	2877	2939	2976	2880	2975	2879	2971
2019	2299	2687	2976	2879	2972	2880	2976	2975	2880	2974	2877	2976
2020	2301	2784	2976	2878	2976	2879	2975	2976	2880	2972	2880	2974
2021	2975	2681	2972	2870	2975	2870	2957	2965	2872	2968	2878	2841
2022	2298	2685	2972	2879	2966	2874	2969	2971	2877	2973	2879	2974
2023	2976	1919	0	0	0	0	0	0	0	0	0	0

## Preliminary validation remarks

The high-resolution GERB radiance and flux data have been compared to the GERB-like product as well as to the CERES SSF Ed. 4A data set. These comparisons show that, in the daily mean, the GERB 4 SW flux dataset is around 10% higher than the CERES SSF dataset. This difference is slightly higher in the summer months than in the winter months. The daily mean of the GERB 4 LW flux is roughly 3% lower than the CERES SSF data set. The difference in seasons is less pronounced in the LW flux.

Also in comparison with GERB-like/SEV 4, the GERB 4 SW fluxes are in the daily mean 12% higher. The LW fluxes are within 1% difference in the daily mean between GERB 4 and GERB-like/SEV 4.

When comparing GERB products of the Edition 1 GERB data (from GERB 1 and GERB 2) with CERES SSF, it was already observed that GERB SW fluxes were higher in daily means but then the difference was about 5 - 7%. The difference between GERB and CERES LW fluxes is however in the same range for all GERB instruments. Comparing Edition 1 GERB data with the corresponding GERB-like/SEVs product shows similar numbers for the SW and LW flux differences as when comparing to CERES.