

## GLI-weighted solar irradiance table

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*Minor calculation error was fixed on 14 March 2003*

We calculated GLI-band solar irradiances that have been weight-integrated the Thuillier-2002 solar spectral irradiance by spectral responses of every GLI bands. The GLI spectral response is running averaged  $\pm 2$  samples (data interval is about 1nm) window to reduce a measurement noise, and both response and solar irradiance datasets are linearly interpolated to 0.1nm spectral resolution before the integration. The weighted integration is operated as follow.

$$F_0(b) = \sum_{i=N1}^{N2} \{E_0(\lambda) \cdot R_b(\lambda = i \times 0.1nm)\} / \sum_{i=N1}^{N2} R_b(\lambda = i \times 0.1nm)$$

$F_0$  is the GLI-weighted solar irradiance,  $E_0$  the Thuillier-2002 solar

spectral irradiance,  $R_b$ , GLI spectral response for band b, N1 and N2 are minimum and maximum wavelength where both the GLI response and Thuillier-2002 solar irradiance are available. From channel 30 (3.7 $\mu$ m) to 36 (12 $\mu$ m) where Thuillier 2002 cannot cover, we used MODTRAN 4.0 for the calculation.

The calculated  $F_0$  are shown in Table 1. GLI calibration group will use the following  $F_0$  (\*1). However, another  $F_0$  (\*2) integrated within  $\pm 2\Delta\lambda$  ( $\Delta\lambda$  is width of half peak power) are used when the precision is enough for the analysis target.

### Reference

Thuillier, G., M. Hers, P. C. Simon, D. Labs, H. Mandel, D. Gillotay, and T. Foujols, The solar spectral irradiance from 200 to 2400 nm as measured by the SOLSPEC spectrometer from the ATLAS 1-2-3 and EURECA missions, Solar Physics, to be submitted, 2002.

Berk, A., and co-authors, 1999: MODTRAN4 radiative transfer modeling for atmospheric correction, SPIE proceeding, Optical Spectroscopic, Techniques and Instrumentation for Atmospheric and Space Research III, Volume 3756.

Table 1: Calculated GLI-weighted full-band solar irradiance values for all channels

GLI channel	$F_0$ [W m <sup>-2</sup> $\mu$ m <sup>-1</sup> ] *1	$F_0$ [W m <sup>-2</sup> $\mu$ m <sup>-1</sup> ] $\pm 2\Delta\lambda$ *2	source
1	1095.696	1095.088	Thuillier 2002
2	1540.339	1540.261	
3	1714.570	1714.271	
4	1885.797	1885.786	
5	2082.035	2082.209	
6	1939.790	1939.741	
7	1792.522	1792.354	
8	1858.035	1858.094	
9	1788.986	1788.717	
10	1651.198	1651.271	Thuillier 2002
11	1522.468	1522.999	
12	1474.721	1474.566	
13	1479.008	1478.794	
14	1394.024	1393.808	
15	1396.239	1396.006	
16	1274.120	1274.033	
17	1248.869	1248.857	
18	956.023	956.079	
19	956.757	957.039	Thuillier 2002
20	1965.331	1965.345	
21	1838.794	1838.836	
22	1532.625	1532.605	
23	1061.675	1061.651	Thuillier 2002
24	654.572	654.581	
25	547.602	547.606	
26	454.842	454.750	
27	363.501	363.498	Thuillier 2002
28	233.004	233.004	
29	86.684	86.684	
30	11.596	11.576	MODTRAN4.0
31	1.164	1.164	
32	0.835	0.835	
33	0.760	0.759	
34	0.441	0.440	
35	0.185	0.185	
36	0.121	0.120	