Table 20.5 Annual radiation availability on different surfaces, for 30 different places all around the world. Various tracking options (1 axis, 2 axis, etc.) described in Section 20.9.2

Location	Lat. ϕ°	$B_{0dy}(0)$ [Wh/m^2]	Clearness index K_{Ty}	Ratios to global horizontal yearly irradiation					
				2 axis	1 Az-axis	1 Ho-axis	1 Po-axis	Fixed β_{opt}	2 axis Conc.
Ice-Island-Arctic	80	4261	0.580	2.75	2.54	1.97	2.60	1.67	2.26
S. Petersburg-Russia	59.9	5703	0.453	1.72	1.64	1.43	1.61	1.18	1.21
Hamburg-Germany	53.6	6437	0.412	1.49	1.42	1.28	1.39	1.11	0.97
Freiburg-Germany	48	7075	0.428	1.42	1.36	1.26	1.33	1.07	0.93
Nantes-France	47.2	7164	0.468	1.50	1.44	1.31	1.41	1.10	1.03
Olympia-USA	46.6	7230	0.437	1.41	1.35	1.27	1.32	1.05	0.93
Changchun-China	43.8	7531	0.510	1.60	1.53	1.35	1.51	1.16	1.13
Sapporo-Japan	43	7615	0.421	1.41	1.35	1.22	1.31	1.09	0.89
Madrid-Spain	40.4	7880	0.544	1.53	1.46	1.36	1.45	1.08	1.12
Seoul-Korea	37.5	8161	0.440	1.39	1.32	1.23	1.30	1.07	0.89
Albuquerque-USA	35	8391	0.687	1.66	1.55	1.47	1.58	1.09	1.37
Djelfa-Algeria	34.6	8427	0.584	1.53	1.44	1.45	1.37	1.06	1.15
El Paso-Mexico	31.5	8691	0.689	1.61	1.49	1.45	1.53	1.07	1.33
Shanghai-China	31.2	8716	0.487	1.36	1.29	1.25	1.27	1.02	0.91
Cairo-Egypt	30.6	8764	0.637	1.53	1.43	1.39	1.46	1.05	1.20
Delhi-India	28.6	8919	0.630	1.56	1.44	1.40	1.47	1.07	1.23
Karachi-Pakistan	24.8	9189	0.560	1.48	1.36	1.35	1.39	1.04	1.13
Morelia-Mexico	19.7	9494	0.415	1.20	1.14	1.14	1.08	0.98	0.70
Dakar-Senegal	14.7	9729	0.599	1.38	1.23	1.31	1.29	0.98	1.04
Bangkok-Thailand	13.7	9768	0.490	1.27	1.16	1.21	1.14	0.98	0.83
Claveria-Philippines	8.6	9924	0.513	1.27	1.13	1.23	1.16	0.95	0.86
Colombo-Sri Lanka	6.9	9961	0.529	1.28	1.12	1.23	1.16	0.96	0.76
Medellin-Colombia	6.2	9974	0.469	1.22	1.08	1.18	1.08	0.95	0.76
Luanda-Angola	−8.8	9918	0.497	1.26	1.12	1.21	1.13	0.95	0.83
El Alto-Bolivia	−16.4	9652	0.579	1.39	1.25	1.31	1.29	0.99	1.04
Sao Paulo-Brazil	−23.5	9267	0.427	1.25	1.19	1.17	1.14	0.99	0.76
Porto Alegre-Brazil	−30	8805	0.505	1.38	1.30	1.26	1.29	1.02	0.93
Bariloche-Argentina	−41.1	7801	0.566	1.58	1.50	1.40	1.50	1.07	1.18
Ushuaia-Argentina	−55	6263	0.402	1.62	1.55	1.30	1.51	1.19	1.07
Little America-Antartic	−78.2	4306	0.577	2.67	2.48	1.87	2.52	1.55	2.12

the equinox days, they receive identical solar irradiation, $B_{0d}(|\phi|)|_{\delta=0}$. And the same is true for surfaces equally tilted with respect to the latitude angle, $B_{0d}(\beta - |\phi|)|_{\delta=0}$. For other than equinox days, this is not exactly true, because sunrise time (and, therefore, the length of daytime and, in turn, the daily extraterrestrial irradiation) depends on latitude, as described by equation (20.7). However, the yearly ratio between extraterrestrial irradiation collected on both inclinations, $B_{0dy}(\beta - |\phi|)/B_{0dy}(|\phi|)$ tends to remain constant. Now, when accounting for the Earth's atmosphere, such site independence is not necessarily maintained, because of the different climatic conditions, that is, the different annual clearness index K_{Ty}, from one site to another. Obviously, the collection of diffuse radiation is less sensitive to inclination angle variations than the collection of direct radiation. Because of this, the lower the K_{Ty} value (the higher the F_{dy}), the slightly less is sharp-pointed curve that should be expected. Figure 20.19 reveals that this tendency is, in fact, very weak, so that the site independence clearly dominates and the function $G_{dy}(\beta - |\phi|)/G_{dy}(\beta_{opt})$ can be properly considered as being a universal invariant.