

Technical Abstract

Global Solar Radiation over Nainital, India

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Daily global solar radiation on a horizontal surface has been measured with the help of a pyranometer (National Instrument Ltd., Calcutta) from January 1985 to December 1987 at Nainital (29°24' N, 79°28' E) in the Kumaun Hills at an altitude of 1938 metres. The monthly average values \bar{H}_g are listed in Table 1. The corresponding values of the mean clearness \bar{H}_g/\bar{H}_0 , where H_0 is the monthly mean extraterrestrial daily global solar radiation, are also listed in Table 1. These results have been correlated versus \bar{S}/\bar{S}_{max} , where \bar{S} is the monthly mean daily duration of sunshine measured with a Campbell Stokes sunshine recorder as listed in Table 1 and \bar{S}_{max} is the maximum possible value of \bar{S} . The regression equation found was

$$\bar{H}_g/\bar{H}_0 = 0.22 + 0.76 \bar{S}/\bar{S}_{max}$$

with a correlation coefficient $r = 0.92$. This relation will be useful for estimating solar radiation from duration of sunshine in locations similar to Nainital.

Table 1. Monthly mean daily global solar radiation, clearness and duration of sunshine at Nainital.

Month	\bar{H}_g (kWh/m ²)	\bar{H}_g/\bar{H}_0	\bar{S} (h)
Jan	4.481	0.753	7.1
Feb	5.339	0.746	6.9
Mar	5.893	0.675	6.9
Apr	6.470	0.638	8.5
May	7.034	0.640	7.4
Jun	7.637	0.677	6.7
Jul	3.790	0.341	2.7
Aug	3.054	0.293	2.7
Sep	4.177	0.455	2.9
Oct	5.171	0.679	6.5
Nov	4.603	0.739	8.2
Dec	4.364	0.785	6.2