

RADIATION FLUXES AT PUNE DURING THE SOLAR ECLIPSE ON 16 FEBRUARY 1980

The magnitudes of the global, diffuse and reflected solar radiation and the net radiation fluxes for the duration of the solar eclipse at Pune on 16 February 1980 were computed, and these were compared with the radiation parameters on the following day 17 February 1980 during the same period to bring out clearly the changes during the eclipse period.

At Pune, the start of the eclipse was at 1420 IST and the end was at 1652 IST. The maximum phase was at 1541 IST which was 90 per cent of totality.

The records of the following instruments installed at the Central Meteorological Observatory, in the Agricultural College Campus at Pune were utilised :

- Pyranometers for measurement of global, diffuse and reflected radiation and
- Funk type pyrriadiometer for measurement of net radiation.

The rate of respective radiation fluxes (calories per square centimetre per minute) were plotted against the time interval and their graphs are given in Fig. 1(a-d). The graphs for 16th and 17th for each parameters are superimposed in the same diagram.

Table 1 gives a comparative study of the fluxes during the period of the eclipse on 16 February 1980 and during the same period on 17th. There was clear sky condition at Pune both on 16th and 17th. Hence, the reduction in fluxes can be taken to be solely due to the eclipse.

2. There were considerable changes in radiation parameters during the eclipse which was partial at Pune.

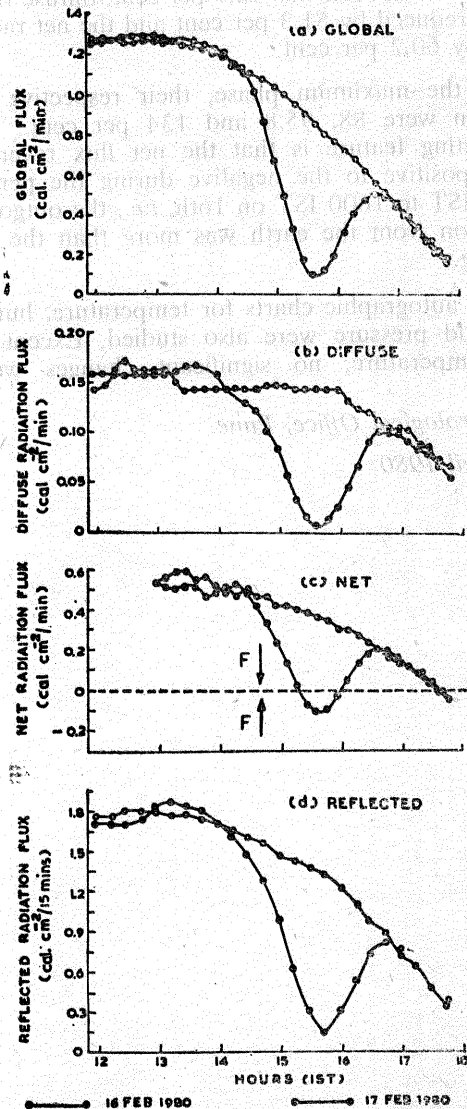


Fig. 1. Changes in radiation fluxes at Pune during the solar eclipse on 16 Feb 1980. Start of eclipse: 1420 IST (1331 LAT). Maximum (90%) 1541 IST (1452 LAT). End of eclipse: 1652 IST (1603 LAT)

TABLE 1
Radiation fluxes at Pune during the solar eclipse on 16 February 1980

Parameters	Total flux during the period 1420 IST to 1652 IST (cal/cm ²)			Flux (cal/cm ² / min.)		
	on 16 Feb 80	on 17 Feb 80	Percentage reduction due to eclipse	At max.	At 1541	Percentage reduction due to eclipse
				phase at 1541 IST on 16 Feb 80	IST on 17 Feb 80	
Global	73.37	128.15	42.7	0.10	0.84	88
Diffuse	9.86	20.23	51.3	0.006	0.14	95.8
Net	20.55	51.60	60.2	-0.12	0.35	134

During the period of the eclipse, the reduction in global radiation was 42.7 per cent, diffuse radiation reduced by 51.3 per cent and the net radiation by 60.2 per cent.

At the maximum phase, their respective reduction were 88, 95.8 and 134 per cent. The interesting feature is that the net flux reversed from positive to the negative during the period 1515 IST to 1600 IST on 16th, *i.e.*, the outgoing radiation from the earth was more than the incoming.

The autographic charts for temperature, humidity and pressure were also studied. Except in the temperature, no significant changes were

noticed in the other elements. The drop in S.S. temperature was 3.9 deg. C on 16th—from 33.4 deg. C at 1445 IST to 29.5 deg. at 1615 IST. The drop in temperature during the same period on 17th was 1.1 deg. C. Considering this as the normal diurnal fall, we can conclude that the net reduction in D.B. temperature solely due to the eclipse was 2.8 deg. C.

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