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## APPLICATION OF BRUNT'S FORMULA FOR FOG AT OZAR AIRFIELD

An attempt is made to fit in the Brunt's radiation formula to fog days and it is noticed that the time of commencement of fog as calculated with Brunt's formula agrees fairly well with actual time of commencement of fog practically on all occasions with an accuracy of about  $\frac{1}{2}$  to 1 hr. Cases where fog lasted for one hour or more are only taken for calculation and application of Brunt's formula.

Fog generally occurs at Ozar airfield during the winter months, viz., November-February. It occurs usually in the early morning hours and it is mainly radiation fog.

2. *Data utilised* — The data utilised have been collected from the Current Weather Registers for the period 1966-81. Departmental definition of fog is followed (Visibility 1 km or less & humidity 75 per cent or more).

The data collected is classified under various heads, viz., monthly frequency, commencement & dissipation of fog etc.

3. The fog occurrence is mostly in November to January. A few instances in February and some in August-October are also observed. 60 per cent fog occurrence is between 0500 & 0700 IST and 25 per cent between 0700 & 0900 IST and 10 per cent between 0400 & 0500 IST. Only on one occasion in 1981 fog commenced before mid-night.

4. 50 per cent of fog occurrence is within the limit of 1 hour of sunrise. Nearly two-thirds of it being within half an hour before or after sunrise. 40 per cent occasions are within the range of 1-2 hours before and after sunrise. On 10 per cent occasions fog occurred earlier than 2 hours before sunrise.

70 per cent of fog dissipation is between 0800 & 1000 IST. Although a few cases are there when fog dissipated between 1000 & 1100 IST. There is a solitary instance when fog dissipated after 1100 hr.

50 per cent of fog period ranges between two and five hours. Nearly on 40 per cent occasions duration ranges less than two hours. On few occasions fog persisted beyond 5 hours, maximum period being a little more than 7 hours.

5. *Fog prediction diagram* — It is noticed that the fog occurred at Ozar airfield is mainly radiation type.

TABLE 1

Date of fog	Commencement		Remarks TT- T <sub>d</sub> T <sub>d</sub>
	Cal. (IST)	Actual (IST)	
10 Dec 66	Not agreeing		<5°C at sunset
4 Oct 67	2231	0650	Do.
13 Oct 67	Not agreeing		Do.
19 Dec 67	0430	Lost for temp. 0510	
20 Dec 67	2348	2340	
14 Jan 68	0012	2325	
25 Sep 68	0345	0515	
16 Sep 71	0816	0800	
12 Nov 78	0626	0551	
13 Nov 78	0730	0615	
14 Nov 78	0530	0550	
2 Dec 78	0630	0630	
4 Dec 78	2223	0215	
5 Dec 78	0733	0830	
13 Feb 79	Not agreeing		>20°C
19 Feb 79	Not agreeing		>12°C
24 Nov 79	0230	0230	
29 Nov 79	0653	0800	
2 Jan 80	Not agreeing		<5°C
24 Dec 80	0700	0700	†
25 Dec 80	0730	0810	
19 Jan 81	2230	2230	
11 Sep 81	2310	2300	
12 Nov 81	0830	0800	

\*Temperature data not available ink faded out. 12 GMT calculations is based on 17 Dec 67 data instead of 18 Dec 67. Observation started at 2340, perhaps fog started earlier also.

†Vis. at 0630 IST : 3000 m, at 0730 IST : 300 m and at 0700 IST : More probable for fog.

The calculation of soil constant "S", correction factor "D" & "E", the actual critical radiative temperature change etc from the fog prediction diagram are fully described by Mohan *et al.* (1983) in their study for Madras.

Table 1 indicates the time of setting of fog by calculations and actual time for occasions during 1966-81. Remarks are provided for cases which are not fitting to the formula.

6. (i) A comparison of calculated time of commencement of fog with that of actual time of commencement of fog shows fairly good agreement in most of the cases with accuracy of  $\frac{1}{2}$  hr to one hr.

(ii) Whenever cloudiness is noticed on the previous day, the formula is not fitting properly.

(iii) Whenever the dry bulb-dew point difference at sunset time is more of the order of 12 deg. C and also less than 5 deg. C, the formula is not fitting properly.

(iv) When there is clear night with calm wind and radiation cooling is expected for favourable setting of fog, the Brunt's formula can definitely be applied to estimate the commencement of fog as the constants  $D$  &  $S$  are readily available for the airfield.

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