

## LETTERS TO THE EDITOR

SEASONAL AND SOLAR CYCLE VARIATIONS  
IN THE OCCURRENCE OF NIGHT  $E_s$  AT  
AHMEDABAD

OCCURRENCE characteristics of the sporadic E ( $E_s$ ) have been reported for different stations by various authors. Kotadia<sup>1</sup> and Degaonkar and Patel<sup>2</sup> have studied the occurrence of sporadic E for the tropical latitude station, Ahmedabad. There are conflicting results, however, about the solar cycle variation of the occurrence of  $E_s$ . Kotadia<sup>1</sup> reported decreasing tendency of the  $E_s$  occurrence with increasing solar activity while Degaonkar and Patel<sup>2</sup> did not find any clear relationship with sunspot number. To confirm this the data at Ahmedabad have been examined further. The occurrence of night  $E_s$  during the years of varying solar activity, viz., 1958 for high, 1961 and 1967 for medium and 1964-65 for low, have been looked into and the solar cycle and seasonal variations are reported here.

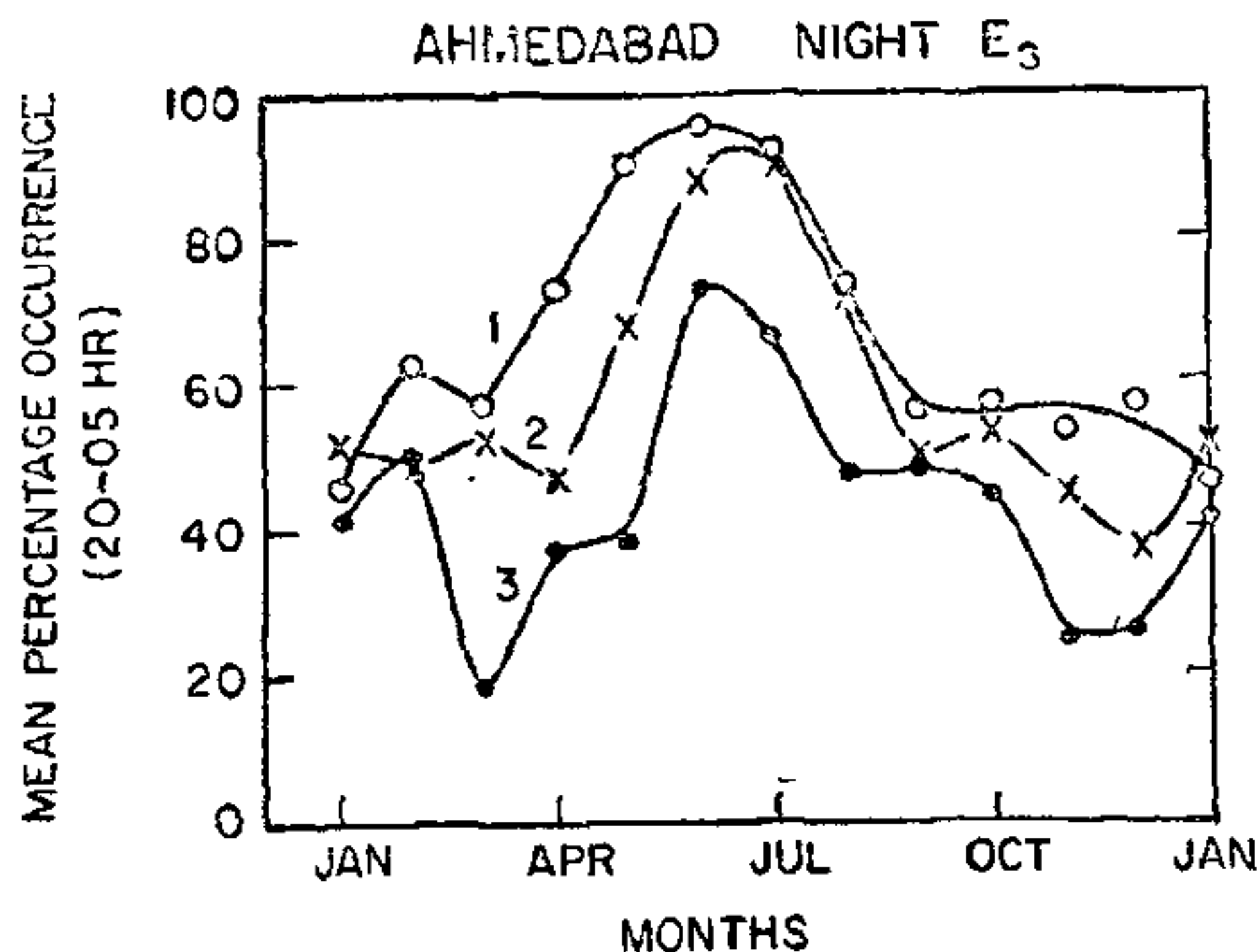


FIG. 1. Month to month variations in the mean percentage occurrences of night  $E_s$  (20-05 hr LT) during high (1958), medium (1961, 67) and low (1964-65) sunspot years. 1 for low, 2 for medium and 3 for high sunspot years.

Hourly data in the period 20-05 hr LT have been combined first and the mean occurrence during each month of the three groups has been computed separately. The month to month variations of the mean percentage occurrences are shown in Fig. 1. Clear seasonal variation is noted with maximum around June-July and minimum in March. The mean occurrences during 1964-65 are the highest while those for 1958 are the lowest. This is also clear from Fig. 2 where seasonal mean nocturnal variations in the occurrence of night  $E_s$  are shown for the three seasons sepa-

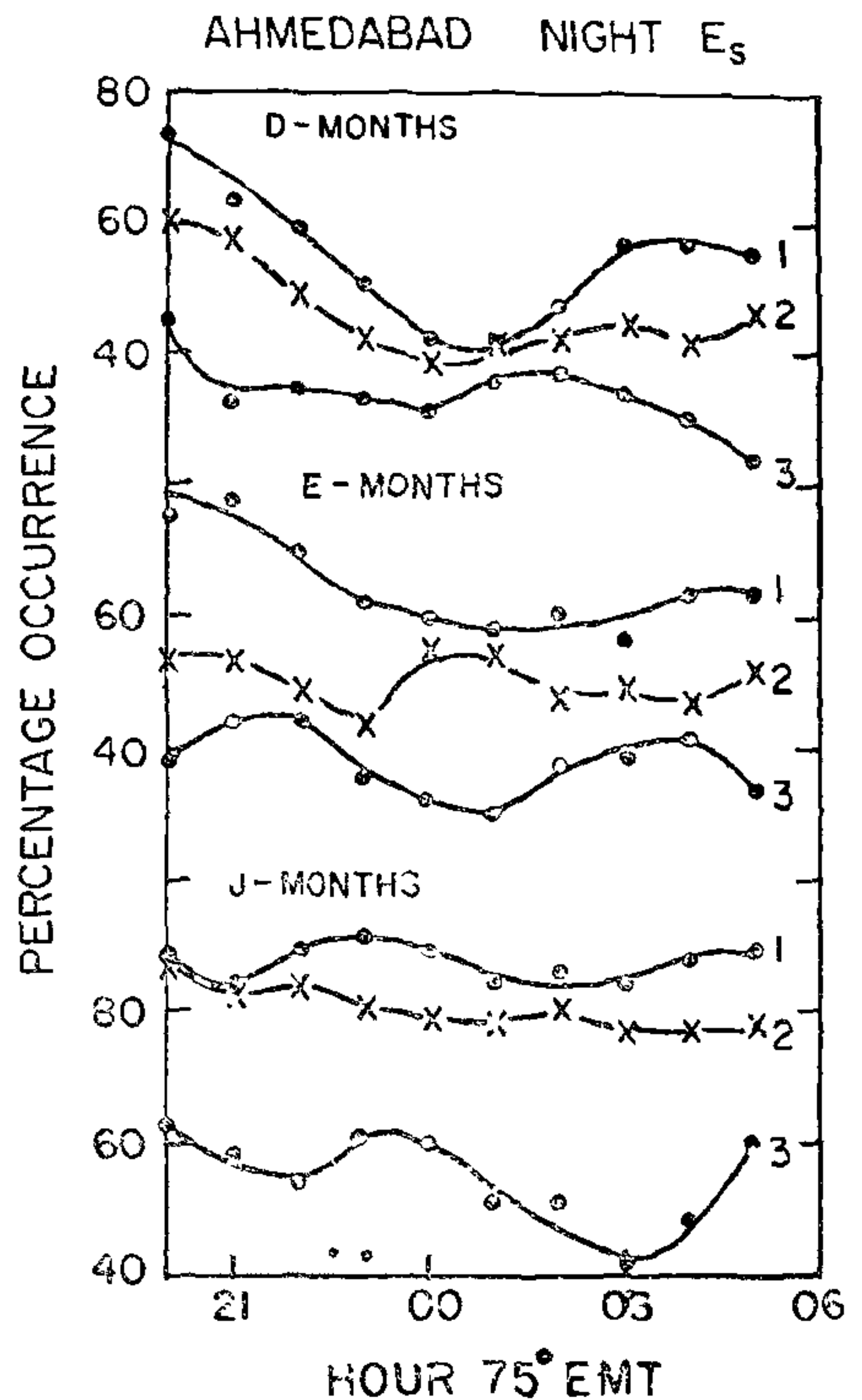


FIG. 2. Seasonal mean nocturnal variations in the occurrence of night  $E_s$  during each of the seasons for the high, medium and low sunspot years. 1 for low, 2 for medium and 3 for high sunspot years.

rately for high, medium and low sunspot years. Thus there is a clear solar cycle variation in the occurrence of night  $E_s$  at Ahmedabad with occurrence increasing with the decreasing solar activity.

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1. Kotadia, K. M., *Ph.D. Thesis*, Gujarat University, 1958.
2. Degaonkar, S. S. and Patel, R. M., *J. Inst. Telecom. Engis.*, 1969, 15 (8), 552.