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Effect of Intermittent Operation of Flare Patrols on Observed Flare Frequency. LOREN ACTON, *Department of Astro-Geophysics, University of Colorado, and National Bureau of Standards.*—It is not required that an observing station observe a solar flare throughout its entire lifetime in order to report the flare. For this reason it is necessary to consider the breaks in observing time as well as the actual observing time when calculating flare frequency. This consideration has been neglected in most earlier studies involving the occurrence frequency of solar flares.

We used the following method, similar to that of Svestka (*Bull. Astron. Inst. Czech.* 7, 9–18, 1954), in calculating the “effective observing time” (E.O.T.) for flares of each importance for each observing station.

$$\text{E.O.T.} = \text{A.O.T.} + \sum_i t_i B_i + t_0 N,$$

where A.O.T. = actual observing time; B_i = number of breaks in observing of duration $t_i < t_0$; N = total number of breaks with duration $t \geq t_0$; t_0 = mean lifetime of flares of a given importance. After analyzing some 300 flares, each reported by two or more observing stations, we adopted the mean flare lifetimes given in Table I.

The percentage changes in observing times range from a low of 4% for 1–flares observed at Capetown to a high of 243% for 3+ flares observed at the Dunsink Observatory. The mean value for importance 2 flares is about 60%.

The application of these corrections yields significant changes in calculations involving the fre-

quency of occurrence of solar flares. Two examples of such changes are: (1) The shape of the curve of flare frequency vs flare importance is changed, the percentage decrease in flares per hour being larger for the larger flares. (2) The disparity of reported flares per hour between different observing stations (Dodson and Hedeman, *J. Geophys. Research* 65, 123, 1960) is considerably lessened when one considers the number of flares per “effective” observing hour rather than the number of flares per actual observing hour.

Atomic Diffusion and Stellar Ages. LAWRENCE H. ALLER, *Observatory of the University of Michigan.*—Generally accepted models of solar-type stars consist of an envelope in convective equilibrium and an inner region in radiative equilibrium. If this outer convective zone is thin, appreciable quantities of metals such as iron can disappear into the interior in periods as short as 5×10^9 years, while in 20×10^9 years the iron-to-hydrogen ratio could be cut down by a factor of the order of 50 with respect to its original value. Hence, atmospheres of very ancient stars could be metal-deficient even though their interiors had a “normal” composition. The spectral energy distributions or colors of such stars could lead to false conclusions concerning their true metal contents and wrong models could be used in age determinations.

If diffusion is important, there will be a pronounced dependence of the metals’ “depletion factor” on its atomic number Z , such that the heavier the atom, the more pronounced its depletion. Earlier empirical discussions suggested that diffusion was probably not important in subdwarfs such as HD 140283, but the problem needs closer theoretical examination. The rate coefficients for diffusion can probably be calculated to better than a factor of 1.5, but the depth of

TABLE I. Mean flare lifetime as a function of importance.

Imp	1–	1	1+	2–	2	2+	3–	3	3+
t_0 (min)	10	20	35	50	60	65	70	75	80