

COMPREHENSIVE FLARE INDEX

The comprehensive flare index (CFI) was developed by Helen W. Dodson and E. Ruth Hedeman (McMath-Hulbert Observatory). The first description is printed in Upper Atmospheric Geophysics (UAG) report #14, "An Experimental, Comprehensive Flare Index and Its Derivation for 'Major' Flares, 1955-1969" Subsequent volumes of CFI indices for more recent years are given in UAG-52 (1970-1974) and UAG-80 (1975-1979). The full set of UAG reports are available online at the following website: <http://www.ngdc.noaa.gov/stp/solar/onlinepubl.html>.

Five measures of flare importance are added to obtain the CFI. They are:

- 1) Importance of ionizing radiation as indicated by time-associated Short Wave Fade or Sudden Ionospheric Disturbance -- Scale 0 - 3.
- 2) Importance of H-alpha flare -- Scale 0 - 3.
- 3) Magnitude of 10.7 cm solar radio flux -- characteristic of the log of flux in units of $10 \exp(-22)$ W/m sq/Hz.
- 4) Dynamic spectrum -- Type II = 1, Continuum = 2, Type IV with duration > 10 minutes = 3.
- 5) Magnitude of ~200 MHz flux -- characteristic of log of flux in same units as 3).

"Major" solar flares are any which satisfy one or more of the following criteria:

- Short wave fade (or Sudden Ionospheric Disturbance) value ≥ 3 .
- H-alpha flare of importance ≥ 3 .
- 10.7 cm flux ≥ 500 units.
- Type II radio burst.
- Type IV radio emission of duration > 10 minutes.

CFI indices have been calculated for all major flares for years 1955 through 1980 and are in file "cfi_major-flares_1955-1980.txt" available in the documentation section.

Anyone having questions about the cfi or other aspects of solar activity and its consequences on Earth and in near-Earth space should contact staff of the National Geophysical Data Center, Solar-Terrestrial Physics Division, solar.ngdc@noaa.gov.