# SAR GLOSSARY OF SOLAR TERRESTRIAL TERMS

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A B C D E F G H I K L M N P Q R S T U V W X Z

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**a INDEX.** A 3-hourly "equivalent amplitude" index of local geomagnetic activity; "a" is related to the 3-hourly K INDEX according to the following scale:

| *K* | *0* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* |
|---|---|---|---|---|---|---|---|---|---|---|
| a | 0 | 3 | 7 | 15 | 27 | 48 | 80 | 140 | 240 | 400 |

**A INDEX.** A daily index of geomagnetic activity derived as the average of the eight 3-hourly a indices.

**ACTIVE.** Geomagnetic levels such that 15 <= Ap < 30.

**ACTIVE DARK FILAMENT (ADF).** An ACTIVE PROMINENCE seen on the DISK.

**ACTIVE LONGITUDE.** The approximate center of a range of heliographic longitudes in which ACTIVE REGIONS are more numerous and more FLARE-active than the average.

**ACTIVE PROMINENCE.** A PROMINENCE displaying material motion and changes in appearance over a few minutes of time.

**ACTIVE PROMINENCE REGION (APR).** A portion of the solar LIMB displaying ACTIVE PROMINENCEs.

**ACTIVE REGION (AR).** A localized, transient volume of the solar atmosphere in which PLAGEs, SUNSPOTS, FACULAe, FLAREs, etc. may be observed.

**ACTIVE SURGE REGION (ASR).** An ACTIVE REGION that exhibits a group or series of spike-like surges that rise above the limb.

**AFRED.** Abbreviation for the A INDEX for Fredericksburg.

**ANGSTROM.** A unit of length = 1.0E-08cm.

**Ap INDEX.** An averaged planetary A INDEX based on data from a set of specific stations.

**ARCH FILAMENT SYSTEM (AFS).** A bright, compact PLAGE crossed by a system of small, arched FILAMENTS, which is often a sign of rapid or continued growth in an ACTIVE REGION.

**ASTRONOMICAL UNIT (AU).** The mean earth-sun distance, equal to 1.496E+13cm or 214.94 solar radii.

**AURORA.** A faint visual phenomenon associated with geomagnetic activity, which occurs mainly in the high-latitude night sky; typical auroras are 100 to 250 km above the ground.

**AURORAL OVAL.** An oval band around each geomagnetic pole which is the locus of structured AURORAe.

**AUTUMNAL EQUINOX.** The EQUINOX that occurs in September.

**BARTEL'S ROTATION NUMBER.** The serial number assigned to 27-day rotation periods of solar and geophysical parameters. Rotation 1 in this sequence was assigned arbitrarily by Bartel to begin in January 1833.

**BRIGHT SURGE ON THE DISK (BSD).** A bright gaseous stream (SURGE) emanating from the

CHROMOSPHERE.

**BRIGHT SURGE ON THE LIMB (BSL).** A large gaseous stream (SURGE) that moves outward more than 0.15 solar radius above the LIMB.

**BURST.** A transient enhancement of the solar RADIO EMISSION, usually associated with an ACTIVE REGION or FLARE.

**CARRINGTON LONGITUDE.** A system of fixed longitudes rotating with the sun.

**CENTIMETER BURST.** A solar radio burst in the centimeter wavelength range.

**CENTRAL MERIDIAN PASSAGE (CMP).** The passage of an ACTIVE REGION or other feature across the longitude meridian that passes through the apparent center of the solar DISK.

**CHROMOSPHERE.** The layer of the solar atmosphere above the PHOTOSPHERE and beneath the TRANSITION REGION and the CORONA.

**CONJUGATE POINTS.** Two points on the earth's surface, at opposite ends of a geomagnetic field line.

**CONTINUUM STORM (CTM).** General term for solar noise lasting for hours and sometimes days.

**COORDINATED UNIVERSAL TIME.** By international agreement, the local time at the prime meridian, which passes through Greenwich, England. Therefore, it is also known as GREENWICH MEAN TIME, or sometimes simply UNIVERSAL TIME.

**CORONA.** The outermost layer of the solar atmosphere, characterized by low densities (<1.0E+09/cc) and high temperatures (>1,0E+06deg.K).

**CORONAL HOLE.** An extended region of the CORONA, exceptionally low in density and associated with unipolar photospheric regions.

**CORONAL RAIN (CRN).** Material condensing in the CORONA and appearing to rain down into the CHROMOSPHERE as observed in H-ALPHA at the solar LIMB above strong SUNSPOTS.

**CORONAL TRANSIENTS.** A general term for short-time-scale changes in the CORONA, but principally used to describe outward-moving PLASMA clouds.

**COSMIC RAY.** An extremely energetic (relativistic) charged particle.

**CROCHET.** A sudden deviation in the sunlit geomagnetic field (H component; see GEOMAGNETIC ELEMENTS) associated with large solar FLARE X-ray emission.

**D REGION.** A daytime layer of the earth's IONOSPHERE approximately 50 to 90 km in altitude.

**DARK SURGE ON DISK (DSD).** Dark gaseous ejections visible in H-ALPHA.

**DIFFERENTIAL ROTATION.** The change in SOLAR ROTATION RATE with latitude. Low latitudes rotate at a faster angular rate (approx. 14 degrees per day) than do high latitudes (approx. 12 degrees per day).

**DISAPPEARING SOLAR FILAMENT (DSF).** The sudden (timescale of minutes to hours) disappearance of a solar FILAMENT (PROMINENCE).

**DISK.** The visible surface of the sun (or any heavenly body) projected against the sky.

**Dst INDEX.** A geomagnetic index describing variations in the equatorial RING CURRENT.

**E REGION.** A daytime layer of the earth's ionosphere roughly between the altitudes of 85 and 140 km.

**EMERGING FLUX REGION (EFR).** An area on the sun where new magnetic flux is erupting.

**ERUPTIVE PROMINENCE ON LIMB (EPL).** A solar PROMINENCE that becomes activated and is seen to ascend from the sun.

**EXTREMELY LOW FREQUENCY (ELF).** That portion of the radio frequency spectrum from 30 to 3000 hertz.

**EXTREME ULTRAVIOLET (EUV).** A portion of the electromagnetic spectrum from approximately 100 to 1000 angstroms.

**F CORONA.** Of the white-light CORONA (that is, the corona seen by the eye at a total solar ECLIPSE), that portion which is caused by sunlight scattered or reflected by solid particles (dust) in interplanetary space.

**F REGION.** The upper layer of the IONOSPHERE, approximately 120 to 1500 km in altitude. The F region is subdivided into the F1 and F2 regions. The F2 region is the most dense and peaks at altitudes between 200 and 600 km. The F1 region is a smaller peak in electron density, which forms at lower altitudes in the daytime.

**FACULA.** A bright region of the PHOTOSPHERE seen in white light, seldom visible except near the solar LIMB.

**FIBRIL.** A linear pattern in the H-ALPHA CHROMOSPHERE of the sun, as seen through an H-alpha filter, occurring near strong SUNSPOTS and PLAGE or in FILAMENT channels.

**FILAMENT.** A mass of gas suspended over the PHOTOSPHERE by magnetic fields and seen as dark lines threaded over the solar DISK. A filament on the LIMB of the sun seen in emission against the dark sky is called a PROMINENCE.

**FILAMENT CHANNEL.** A broad pattern of FIBRILS in the CHROMOSPHERE, marking where a FILAMENT may soon form or where a filament recently disappeared.

**FLARE.** A sudden eruption of energy on the solar DISK lasting minutes to hours, from which radiation and particles are emitted.

**fMIN.** The lowest radiowave frequency that can be reflected from the IONOSPHERE.

**foEs.** The maximum ORDINARY MODE radiowave frequency capable of reflection from the SPORADIC E REGION of the IONOSPHERE.

**foF2.** The maximum ORDINARY MODE radiowave frequency capable of reflection from the F2 REGION of the IONOSPHERE.

**FORBUSH DECREASE.** An abrupt decrease, of at least 10%, of the background galactic COSMIC RAY intensity as observed by neutron monitors.

**GAMMA.** A unit of magnetic field intensity equal to 1 x 10.0E-05 GAUSS, also equal to 1 NANOTESLA.

**GAMMA RAYS.** High energy radiation (energies in excess of 100 keV) observed during large, extremely energetic solar FLARES.

**GAUSS.** The unit of magnetic induction in the cgs (centimeter-gram-second) system.

**GEOMAGNETIC ELEMENTS.** The components of the geomagnetic field at the surface of the earth. In SESC use, the northward and eastward components are often called the H and D components, where the D component is expressed in gammas and is derived from D (the declination angle) using the small angle approximation.

**GEOMAGNETIC FIELD.** The magnetic fiebserved in and around the earth. The intensity of the magnetic field at the earth's surface is approximately 0.32 gauss at the equator and 0.62 gauss at the north pole.

**GEOMAGNETIC STORM.** A worldwide disturbance of the earth's magnetic field, distinct from regular diurnal variations.

***Minor Geomagnetic Storm:*** A storm for which the Ap index was greater than 29 and less than 50.

***Major Geomagnetic Storm:*** A storm for which the Ap index was greater than 49 and less than 100.

***Severe Geomagnetic Storm:*** A storm for which the Ap index was 100 or more.

***Initial Phase:*** Of a geomagnetic storm, that period when there may be an increase of the MIDDLE-LATITUDE horizontal intensity (H).

***Main Phase:*** Of a geomagnetic storm, that period when the horizontal magnetic field at middle latitudes is generally decreasing.

***Recovery Phase:*** Of a geomagnetic storm, that period when the depressed northward field component returns to normal levels.

**GEOSYNCHRONOUS.** Term applied to any equatorial satellite with an orbital velocity equal to the rotational velocity of the earth. The net effect is that the satellite is virtually motionless with respect to an observer on the ground.

**GMT.** Greenwich Mean Time. (See COORDINATED UNIVERSAL TIME.)

**GRADUAL COMMENCEMENT.** The commencement of a geomagnetic storm that has no well-defined onset.

**GRANULATION.** Cellular structure of the PHOTOSPHERE visible at high spatial resolution.

**GREEN LINE.** The green line is one of the strongest (and first-recognized) visible coronal lines. It identifies moderate temperature regions of the CORONA.

**Greenwich Mean Time.** See COORDINATED UNIVERSAL TIME.

**GROUND-LEVEL EVENT (GLE).** A sharp increase in ground-level COSMIC RAY count to at least 10% above background, associated with solar protons of energies greater than 500 MeV. GLEs are relatively rare, occurring only a few times each SOLAR CYCLE.

**H-ALPHA.** This ABSORPTION LINE of neutral hydrogen falls in the red part of the visible spectrum and is convenient for solar observations. The H-alpha line is universally used for patrol observations of solar flares.

**H-component of the Geomagnetic Field.** See GEOMAGNETIC ELEMENTS.

**HIGH FREQUENCY (HF).** That portion of the radio frequency spectrum between 3 and 30 MHz.

**HIGH LATITUDES.** With specific reference to zones of geomagnetic activity, "high latitudes" refers to 50o to 80o geomagnetic.

**HIGH-SPEED STREAM.** A feature of the SOLAR WIND having velocities that are about double average solar wind values.

**HOMOLOGOUS FLARES.** Solar flares that occur repetitively in the same ACTIVE REGION, with essentially the same position and with a common pattern of development.

**HYDER FLARE.** A FILAMENT-associated TWO-RIBBON FLARE, often occurring in spotless regions. The flare presumably results from the impact on the CHROMOSPHERE of infalling FILAMENT material.

**INTERPLANETARY MAGNETIC FIELD (IMF).** The magnetic field carried with the SOLAR WIND.

**IONOSPHERE.** The region of the earth's upper atmosphere containing a small percentage of free electrons and ions produced by photoionization of the constituents of the atmosphere by solar ultraviolet radiation at very short wavelengths (<1000 angstroms). The ionosphere significantly influences radiowave propagation of frequencies less than about 30 MHz.

**IONOSPHERIC STORM.** A disturbance in the F REGION of the IONOSPHERE, which occurs in connection with geomagnetic activity.

**K CORONA.** Of the white-light CORONA (that is, the corona seen by the eye at a total solar eclipse), that portion which is caused by sunlight scattered by electrons in the hot outer atmosphere of the sun.

**K INDEX.** A 3-hourly quasi-logarithmic local index of geomagnetic activity relative to an assumed quiet-day curve for the recording site. Range is from 0 to 9. The K index measures the deviation of the most disturbed horizontal component.

**KELVIN.** A unit of absolute temperature.

**Kp INDEX.** A 3-hourly planetary geomagnetic index of activity generated in Gottingen, Germany, based on the K INDEX from 12 or 13 stations distributed around the world.

**LEADER SPOT.** In a magnetically bipolar or multipolar SUNSPOT group, the western part precedes and the main spot in that part is called the leader.

**LIGHT BRIDGE.** Observed in white light, a bright tongue or streaks penetrating or crossing SUNSPOT UMBRAe. The appearance of a light bridge is frequently a sign of impending region division or dissolution.

**LIMB.** The edge of the solar DISK.

**LIMB FLARE.** A solar FLARE seen at the edge (LIMB) of the sun.

**LOOP PROMINENCE SYSTEM (LPS).** A system of loop prominences associated with major FLARES.

**LOW FREQUENCY (LF).** That portion of the radio frequency spectrum from 30 to 300 kHz.

**M 3000.** The optimum HIGH FREQUENCY radio wave with a 3000 km range, which reflects only once from the IONOSPHERE (single hop transmission).

**MAGNETIC BAY.** A relatively smooth excursion of the H (horizontal) component (see GEOMAGNETIC ELEMENTS) of the geomagnetic field away from and returning to quiet levels.

**MAGNETOGRAM.** Solar magnetograms are a graphic representation of solar magnetic field strengths and polarity.

**MAGNETOPAUSE.** The boundary layer between the SOLAR WIND and the MAGNETOSPHERE.

**MAGNETOSPHERE.** The magnetic cavity surrounding the earth, carved out of the passing SOLAR WIND by virtue of the GEOMAGNETIC FIELD, which prevents, or at least impedes, the direct entry of the solar wind PLASMA into the cavity.

**MeV.** Mega (million) electronvolt. A unit of energy used to describe the total energy carried by a particle or photon.

**MEDIUM FREQUENCY (MF).** That portion of the radio frequency spectrum from 0.3 to 3 MHz.

**MICROWAVE BURST.** A radiowave signal associated with optical and/or X-ray FLAREs.

**MIDDLE LATITUDES.** With specific reference to zones of geomagnetic activity "middle latitudes" refers to 20 deg. to 50 deg. geomagnetic.

**MOUNT WILSON MAGNETIC CLASSIFICATIONS.**

***Alpha.*** Denotes a unipolar SUNSPOT group.

***Beta.*** A sunspot group having both positive and negative magnetic polarities, with a simple and distinct division between the polarities.

***Beta-Gamma.*** A sunspot group that is bipolar but in which no continuous line can

be drawn separating spots of opposite polarities.

***Delta.*** A complex magnetic configuration of a solar sunspot group consisting of opposite polarity UMBRAe within the same PENUMBRA.

***Gamma.*** A complex ACTIVE REGION in which the positive and negative polarities are so irregularly distributed as to prevent classification as a bipolar group.

**NANOTESLA (nT).** A unit of magnetism 10.0E-09 tesla, equivalent to a gamma (10.0E-05 gauss).

**NEUTRAL LINE.** The line that separates longitudinal magnetic fields of opposite polarity.

**PENUMBRA.** The SUNSPOT area that may surround the darker UMBRA or umbrae. It consists of linear bright and dark elements radial from the sunspot umbra.

**PERSISTENCE.** Continuation of existing conditions. When a physical parameter varies slowly, the best prediction is often persistence.

**PHOTOSPHERE.** The lowest layer of the solar atmosphere; corresponds to the solar surface viewed in WHITE LIGHT. SUNSPOTs and FACULAe are observed in the photosphere.

**PLAGE.** An extended emission feature of an ACTIVE REGION that exists from the emergence of the first magnetic flux until the widely scattered remnant magnetic fields merge with the background.

**PLAGE CORRIDOR.** A space in chromospheric (see CHROMOSPHERE) PLAGE lacking plage intensity, coinciding with polarity inversion line.

**PLASMA.** Any ionized gas, that is, any gas containing ions and electrons.

**POLAR CAP ABSORPTION (PCA).** An anomalous condition of the polar IONOSPHERE whereby HF and VHF (3 - 300 MHz) radiowaves are absorbed, and LF and VLF (3 - 300 kHz) radiowaves are reflected at lower altitude than normal. In practice, the absorption is inferred from the proton flux at energies greater than 10 MeV, so that PCAs and PROTON EVENTs are simultaneous. Transpolar radio paths may still be disturbed for days, up to weeks, following the end of a proton event.

**POST-FLARE LOOPS.** A LOOP PROMINENCE SYSTEM often seen after a major TWO-RIBBON FLARE, which bridges the ribbons.

**PROMINENCE.** A term identifying cloud-like features in the solar atmosphere. The features appear as bright structures in the CORONA above the solar LIMB and as dark FILAMENTs when seen projected against the solar DISK.

**PROTON EVENT.** By definition, the measurement of at least 10 protons/sq.cm/sec/steradian at energies greater than 10 MeV.

**PROTON FLARE.** Any FLARE producing significant FLUXes of greater-than-10 MeV protons in the vicinity of the earth.

**QUIESCENT PROMINENCE (FILAMENT).** Long, sheet-like prominences nearly vertical to the solar surface.

**QUIET.** A descriptive word specifically meaning geomagnetic levels such that Ap < 8 (see Ap INDEX).

**RADIO EMISSION.** Emissions of the sun in radio wavelengths from centimeters to dekameters, under both quiet and disturbed conditions.

***Type I.*** A noise storm composed of many short, narrow-band bursts in the metric range (300 - 50 MHz).

***Type II.*** Narrow-band emission that begins in the meter range (300 MHz) and sweeps slowly (tens of minutes) toward dekameter wavelengths (10 MHz). Type II emissions occur in loose association with major FLAREs and are indicative of a SHOCK wave

moving through the solar atmosphere.

***Type III.*** Narrow-band bursts that sweep rapidly (seconds) from decimeter to dekameter wavelengths (500 - 0.5 MHz). They often occur in groups and are an occasional feature of complex solar ACTIVE REGIONs.

***Type IV.*** A smooth continuum of broad-band bursts primarily in the meter range (300 - 30 MHz). These bursts are associated with some major flare events beginning 10 to 20 minutes after the flare maximum, and can last for hours.

**RECURRENCE.** Used especially in reference to the recurrence of physical parameters every 27 days (the rotation period of the sun).

**RIOMETER (Relative Ionospheric Opacity meter).** A specially designed radio receiver for continuous monitoring of COSMIC NOISE. The absorption of cosmic noise in the polar regions is very sensitive to the solar low-energy cosmic ray flux.

**SECTOR BOUNDARY.** In the SOLAR WIND, the area of demarcation between sectors, which are large-scale features distinguished by the predominant direction of the interplanetary magnetic field, toward or away from the sun.

**SHORT WAVE FADE (SWF).** A particular ionospheric solar flare effect under the broad category of sudden ionospheric disturbances (SIDs) whereby short-wavelength radio transmissions, VLF, through HF, are absorbed for a period of minutes to hours.

**SMOOTHED SUNSPOT NUMBER.** An average of 13 monthly RI numbers, centered on the month of concern.

**SOLAR COORDINATES.**

***Central Meridian Distance (CMD).*** The angular distance in solar longitude measured from the central meridian.

**SOLAR CYCLE.** The approximately 11-year quasi-periodic variation in frequency or number of solar active events.

**SOLAR MAXIMUM.** The month(s) during the SOLAR CYCLE when the 12-month mean of monthly average SUNSPOT NUMBERS reaches a maximum. The most recent solar maximum occurred in December 1979.

**SOLAR MINIMUM.** The month(s) during the SOLAR CYCLE when the 12-month mean of monthly average SUNSPOT NUMBERS reaches a minimum.

**SOLAR SECTOR BOUNDARY (SSB).** The apparent solar origin, or base, of the interplanetary SECTOR BOUNDARY marked by the larger-scale polarity inversion lines.

**SOLAR WIND.** The outward flux of solar particles and magnetic fields from the sun. Typically, solar wind velocities are near 350 km/s.

**SPORADIC E.** A phenomenon occurring in the E REGION of the IONOSPHERE, which significantly affects HF radiowave propagation. Sporadic E can occur during daytime or nighttime and it varies markedly with latitude.

**SUDDEN COMMENCEMENT(SC, or SSC for Storm Sudden Commencement).** An abrupt increase or decrease in the northward component of the geomagnetic field, which marks the beginning of a GEOMAGNETIC STORM.

**SUDDEN IMPULSE (SI+ or SI-).** A sudden perturbation of several gammas in the northward component of the low-latitude geomagnetic field, not associated with a following GEOMAGNETIC STORM. (An SI becomes an SC if a storm follows.)

**SUDDEN IONOSPHERIC DISTURBANCE (SID).** HF propagation anomalies due to ionospheric changes resulting from solar FLAREs, PROTON EVENTs and GEOMAGNETIC STORMs.

**SUNSPOT.** An area seen as a dark spot on the PHOTOSPHERE of the sun. Sunspots are

concentrations of magnetic flux, typically occurring in bipolar clusters or groups. They appear dark because they are cooler than the surrounding photosphere.

**SUNSPOT GROUP CLASSIFICATION (Modified Zurich Sunspot Classification).**

***A*** - A small single unipolar SUNSPOT or very small group of spots without PENUMBRA.

***B*** - Bipolar sunspot group with no penumbra.

***C*** - An elongated bipolar sunspot group. One sunspot must have penumbra.

***D*** - An elongated bipolar sunspot group with penumbra on both ends of the group.

***E*** - An elongated bipolar sunspot group with penumbra on both ends. Longitudinal extent of penumbra exceeds 10 deg. but not 15 deg.

***F*** - An elongated bipolar sunspot group with penumbra on both ends. Longitudinal extent of penumbra exceeds 15 deg.

***H*** - A unipolar sunspot group with penumbra.

**SUNSPOT NUMBER.** A daily index of SUNSPOT activity (R), defined as R = k (10 g + s) where S = number of individual spots, g = number of sunspot groups, and k is an observatory factor.

**SURGE.** A jet of material from ACTIVE REGIONs that reaches coronal heights and then either fades or returns into the CHROMOSPHERE along the trajectory of ascent.

**TWO-RIBBON FLARE.** A FLARE that has developed as a pair of bright strands (ribbons) on both sides of the main inversion ("neutral") line of the magnetic field of the ACTIVE REGION.

**TYPE I, II, III, IV.** See RADIO EMISSION

**U BURST.** A fast radio burst spectrum of a FLARE. It has a U-shaped appearance in an intensity-vs.-frequency plot.

**ULTRA HIGH FREQUENCY (UHF).** Those radio frequencies exceeding 300 MHz.

**UMBRA.** The dark core or cores (umbrae) in a SUNSPOT with PENUMBRA, or a sunspot lacking penumbra.

**UNIVERSAL TIME (UT).** See COORDINATED UNIVERSAL TIME.

**UNSETTLED.** With regard to geomagnetic levels, a descriptive word specifically meaning that 7 < the Ap INDEX < 15.

**VERY HIGH FREQUENCY (VHF).** That portion of the radio frequency spectrum from 30 to 300 MHz.

**VERY LOW FREQUENCY (VLF).** That portion of the radio frequency spectrum from 3 to 30 kHz.

**WHITE LIGHT (WL).** Sunlight integrated over the visible portion of the spectrum (4000 - 7000 angstroms) so that all colors are blended to appear white to the eye.

**WHITE LIGHT FLARE.** A major FLARE in which small parts become visible in white light. Such flares are usually strong X-ray, radio, and particle emitters.

**WOLF NUMBER.** An historic term for SUNSPOT NUMBER. In 1849, R. Wolf of Zurich originated the general procedure for computing the sunspot number.

**X-RAY BACKGROUND.** A daily average background X-ray FLUX in the 1 to 8 angstrom range. It is a midday minimum designed to reduce the effects of FLAREs.

**X-RAY BURST.** A temporary enhancement of the X-ray emission of the sun. The time-intensity profile of soft X-ray bursts is similar to that of the H-ALPHA profile of an associated

FLARE.

**X-RAY FLARE CLASS.** Rank of a FLARE based on its X-ray energy output. Flares are classified by the order of magnitude of the peak burst intensity (I) measured at the earth in the 1 to 8 angstrom band as follows:

***Class (in Watt/sq. Meter)***

***B*** I < 10.0E-06

***C*** 10.0E-06 <= I <= 10.0E-05

***M*** 10.0E-05 <= I <= 10.0E-04

***X*** I >= 10.0E-04

**ZURICH SUNSPOT CLASSIFICATION.** A sunspot classification system that has been modified for SESC use.



**** END OF SAR DEFINITIONS ****

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**OTHER ARTICLES BY MR. VÄINÖ K. LEHTORANTA:**

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