



# Space Weather Introductory Course

## List of abbreviations

|         |   |               |  |
|---------|---|---------------|--|
| 2D      | Two dimensional   | AWACS         | Airborne early Warning And Control Station   |
| 3D      | Three dimensional   | AZA           | Auroral Zone Absorption  |
| Å       | Ångström (0.1 nm or $10^{-10}$ m)   | $\beta$       | Plasma beta parameter (the ratio of the plasma pressure to the magnetic pressure)                      |
| A       | Area  | B             | Magnetic field (strength)  |
| A/C     | Aircraft  | BDE           | Bidirectional beams of suprathermal ( $> 100$ eV) electrons  |
| aBG     | Above background  | BeiDou        | Chinese GNSS   |
| Ac      | Corrected area (e.g. for line-of-sight)   | BELSPO        | Belgian Science Policy Office  |
| ACE     | Advanced Composition Explorer   | BGS           | British Geological Survey  |
| AE      | Auroral Electrojet  | BISA          | Belgian Institute for Space Aeronomy   |
| $A_e$   | Effective Area  | BMD           | Ballistic Missile Defense  |
| AFB     | Air Force Base  | B.USOC        | Belgian User Support and Operation Center  |
| AFFECTS | Advanced Forecast For Ensuring Communications Through Space   | Bz            | Component of the IMF perpendicular to the ecliptic ("north-south" component)                           |
| AFWA    | Air Force Weather Agency  | $c_0$         | Speed of light in vacuum   |
| AGU     | American Geophysical Union  | C-class flare | Common x-ray flare   |
| AH-64   | Apache military helicopter  | C/ $N_0$      | Carrier-to-Noise (dB-Hz)   |
| AIA     | Atmospheric Imaging Assembly (SDO)  | Ca II H       | A blue line in the solar spectrum at 396.85 nm   |
| Al      | Aluminum  | Ca II K       | A blue line in the solar spectrum at 393.37 nm   |
| AM      | Amplitude Modulation  | CACTus        | Computer Aided CME Tracking software   |
| anaprop | Anomalous Propagation   | CALLISTO      | Compound Astronomical Low frequency Low cost Instrument for Spectroscopy and Transportable Observatory |
| AOCS    | Air Operations Control Station  | CCD           | Charge-Coupled Device  |
| $A_p$   | A geomagnetic index, ranging from 0 (quiet) to 400 nT (extremely severe storm)                          | CDAW          | Coordinated data analysis workshop (NASA/GSFC)   |
| APS     | Active Pixel Sensor   | CELIAS        | Charge, Element, and Isotope Analysis System (SOHO)  |
| APV     | Approach with vertical guidance   | CESRA         | Community of European Solar Radio Astronomers  |
| Ar      | Argon   | cgs           | Metric system based on the centimeter, the gram, and the second  |
| AR      | Active Region   | CH            | Coronal Hole   |
| ARCAS   | Augmented Resolution Callisto Spectrometer  | CIR           | Co-rotating Interaction Region   |
| ASFC    | Australian Space Forecast Center (SWS)  |               |  |
| ASPIICS | Association of Spacecraft for Polarimetric and Imaging Investigation of the Corona of the Sun (PROBA-3) |               |  |
| ATC     | Air Traffic Control   |               |  |
| ATM     | Air Traffic Management  |               |  |
| AU      | Astronomical Unit; about 150 million km   |               |  |



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|                    |  |                    |  |
|--------------------|--|--------------------|--|
| CISM               | Center for Integrated Space Weather Modeling                                       | DSLP               | Dual Segmented Langmuir Probe (PROBA2)   |
| Cluster            | ESA/NASA mission to study the Earth's magnetosphere (no acronym)                   | DSP                | Digital Signal Processing  |
| CM                 | Central Meridian   | Dst                | Disturbance Storm Time index   |
| CMD                | Central Meridian Distance  | $D_{\text{Tropo}}$ | Tropospheric delay   |
| CME                | Coronal Mass Ejection  | $e^-$              | electron   |
| COMESSEP           | COronal Mass Ejections and Solar Energetic Particles                               | E                  | (1) Electric fields; (2) Electrical efficiency of an antenna   |
| CONUS              | Continental United States  | e-Callisto         | extended Compact Astronomical Low-cost Low-frequency Instrument for Spectroscopy and Transportable Observatory |
| COPUOS             | COmmittee on the Peaceful Uses of Outer Space (UN)                                 | ECA                | European Cockpit Association   |
| COR (1/2)          | Coronagraph (Inner/Outer) onboard STEREO   | ECMWF              | European Centre for Medium-range Weather Forecasts   |
| COSPAR             | COmmittee on SPACe Research  | EDACs              | Error-detection-and-correction algorithms  |
| COST               | (European) COoperation in Science & Technology                                     | EGNOS              | European Geostationary Navigation Overlay Service  |
| CRF                | Cosmic Ray Flux  | EGU                | European Geosciences Union   |
| CRC                | Control and Reporting Center   | EHF                | Extreme High Frequency   |
| CSHKP              | Carmichael, Sturrock, Hirayama, Kopp and Pnevman (standard model for solar flares) | EIA                | Equatorial Ionization Anomaly  |
| CSL                | Centre Spatial de Liège  | EISCAT             | European Incoherent SCATter scientific association   |
| CTM                | Continuum storm (radio)  | EIT                | Extreme ultraviolet Imaging Telescope (SOHO)   |
| CubeSat            | A small satellite measuring 10cm x 10cm x 10cm                                     | EIT-wave           | A coronal wave named after the EIT instrument  |
| CW                 | Continuous Wave  | EIWG               | Earth ionosphere waveguide   |
| D-RAP              | D Region Absorption Predictions (NOAA/SWPC)  | ELF                | Extremely Low Frequency  |
| dB                 | (1) Decibel ; (2) change in magnetic field amplitude                               | EM                 | Electromagnetic  |
| dB <sub>i</sub>    | dB with reference to an isotropic antenna  | ENLIL              | Sumerian god of wind and storms (NOT an acronym)   |
| dB <sub>m</sub>    | dB with reference to 1 mW  | ENTSO-E            | European Network of Transmission System Operators  |
| dBW                | Decibel Watt   | EPAM               | Electron, Proton, and Alpha Monitor (ACE)  |
| D                  | Directivity of an antenna  | EPB                | Equatorial Plasma Bubble   |
| DH                 | Decametric-Hectometric   | EPCARD             | European Program Package for the Calculation of Aviation Route Doses   |
| $D_{\text{Iono}}$  | Ionospheric delay  | EPN                | EUREF Permanent Network  |
| DN                 | Digital Number (pixel values not calibrated into physically meaningful units)      | EPT                | Energetic Particle Telescope (PROBA-V)   |
| DOI                | Digital Object Identifier  | erg                | unit of energy (1 erg = $10^{-7}$ J)   |
| DOP                | Dilution Of Precision  | ESA                | European Space Agency  |
| DOY                | Day Of Year  | ESC                | Expert Service Centre (ESA/SSA)  |
| DRAO               | Dominion Radio Astrophysical Observatory   | ESD                | Electrostatic Discharge  |
| DSCOV <sub>R</sub> | Deep Space Climate Observatory   |                    |  |



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|                      |   |           |   |
|----------------------|---|-----------|---|
| ESERO                | European Space Education Resource Office  | FMI       | Finnish Meteorological Institute  |
| ESF                  | Equatorial Spread F   | foE       | Critical frequency E-layer  |
| ESOC                 | European Space Operations Centre  | foF2      | Critical frequency F2-layer   |
| ESP                  | EUV SpectroPhotometer (SDO)   | FOT       | Frequency of Optimum Traffic  |
| ESTEC                | European Space Research and Technology Centre   | FOV       | Field-Of-View   |
| ESWP                 | European Space Weather Portal   | FP7       | Framework Program 7 (EU)  |
| ESWW                 | European Space Weather Week   | FTE       | Fast Transit Event  |
| ETH Zürich           | Eidgenössische Technische Hochschule Zürich   | G         | (1) Gauss (1 G = 100.000 nT) ;<br>(2) NOAA's scale for geomagnetic storms; (3) Gain of an antenna |
| EU                   | European Union  | GAGAN     | GPS Aided GEO Augmented Navigation (India)  |
| EUHFORIA             | European Heliospheric Forecasting Information Asset   | Galileo   | European GNSS   |
| EUI                  | Extreme-Ultraviolet Imagers (Solar Orbiter)   | GCR       | Galactic Cosmic Rays  |
| EUMETNET             | European Meteorological services Network  | GDM-TEC   | Global daily mean Total Electron Content  |
| EUMETSAT             | European Organization for the Exploitation of Meteorological Satellites                                 | GEO       | Geostationary Earth orbit (at altitude of 35.786 kilometers)                                      |
| EUREF                | EUropean Reference Frame  | GeV       | Giga electronvolt ( $10^9 \cdot 1.6 \cdot 10^{-19}$ Joule)  |
| EURISGIC             | European Risk from Geomagnetically Induced Currents project (FP7)                                       | GHz       | Gigahertz ( $10^9$ Hz)  |
| EUV                  | Extreme Ultraviolet   | GIC       | Geomagnetically induced current   |
| EUVI                 | Extreme Ultraviolet Imager (STEREO/SECCHI)  | GLE       | Ground Level Enhancement  |
| EVA                  | Extravehicular activity   | GLONASS   | GLObal NAVigation Satellite System (Russia)   |
| EVE                  | Extreme ultraviolet Variability Experiment (SDO)  | GMDSS     | Global Maritime Distress and Safety System  |
| EWC                  | Early Warning Capability  | GNSS      | Global Navigation Satellite System  |
| $\Phi$               | Flux  | GNSS4SWEC | Advanced GNSS tropospheric products for the monitoring of Severe Weather Events and Climate       |
| f                    | frequency   | GOES      | Geostationary Operational Environmental Satellite   |
| F <sub>10.7 cm</sub> | Solar radio flux at 10.7 cm wavelength  | GONG      | Global Oscillation Network Group  |
| F10.7P               | Proxy for F10.7 cm radio flux (= (F10.7 + F10.7A)/2, with F10.7A the average over the previous 81 days) | GP-B      | Gravity Probe B (2004-2010)   |
| F <sub>2</sub>       | Main ionospheric layer  | GPS       | Global Positioning System (USA)   |
| FAA                  | Federal Aviation Administration   | GRAPE     | GNSS Research and Application for Polar Environment   |
| FADEC                | Full Authority Digital Engine Control   | GSFC      | Goddard Space Flight Center   |
| FC                   | Faraday Cup (DISCOVER)  | GSM       | Global System for Mobile Communications   |
| Fe xvi               | Fifteen times ionized iron  | GSO       | Geosynchronous orbit  |
| FLRW                 | Field line random walk  | GSSAC     | German Space Situational Awareness Center   |
| FM                   | Frequency Modulation  |           |   |



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|                               |  |            |   |
|-------------------------------|--|------------|---|
| Gy                            | Gray (J/kg ; absorbed radiation dose)                                    | IEEE       | Institute of Electrical and Electronics Engineers                             |
| h                             | Planck's constant (6.62607004 × 10 <sup>-34</sup> m <sup>2</sup> kg / s) | IF         | Intermediate Frequency  |
| H, H <sub>2</sub>             | Hydrogen, molecular hydrogen   | IFF        | Identification Friend or Foe  |
| H2020                         | Horizon 2020; EU Research and Innovation program (2014 to 2020)          | IGS        | International GNSS Service  |
| H <sub>2</sub> O              | Water, water vapour  | IGSO       | Inclined geosynchronous orbit   |
| H-alpha (H $\alpha$ )         | A red visible spectral line at 656.28 nm created by Hydrogen             | ILWS       | International Living With a Star (Program)                                    |
| h <sub>c</sub>                | Critical height  | IMF        | Interplanetary Magnetic Field   |
| HCS                           | Heliospheric Current Sheet   | IMPACT     | In-situ Measurements of Particles and CME Transients (STEREO)                 |
| He                            | Helium   | INTEGRAL   | INTErnational Gamma-Ray Astrophysics Laboratory                               |
| HEK                           | Heliophysics Events Knowledgebase  | IP         | Interplanetary  |
| HELCASTS                      | HELiospheric Cataloguing, Analysis and Techniques Service                | IPSES      | International Space Environment Services                                      |
| HEO                           | High Earth orbit (altitude > 35.786 km)                                  | IIFR       | Interpolated In-Field Referencing   |
| HF                            | High Frequency (3-30 MHz)  | IPB        | Ionospheric Plasma Bubble   |
| HI                            | Heliospheric Imager (STEREO)   | IPS        | Interplanetary Scintillation  |
| Hinode                        | A JAXA/NASA solar mission  | IPT-SWeISS | Inter-Programme Team on Space Weather Information, Systems and Services (WMO) |
| h <sub>m</sub> F <sub>2</sub> | peak electron density height of F <sub>2</sub> -layer                    | IR         | Infrared  |
| HMI                           | Heliospheric and Magnetic Imager (SDO)                                   | IRIS       | Interface Region Imaging Spectrograph   |
| hr                            | hour   | IRNSS      | Indian Regional Navigation Satellite System (Regional system; India)          |
| HSRS                          | Humain Solar Radio Spectrograph  | ISES       | International Space Environment Service                                       |
| HSS                           | High Speed Stream  | ISOON      | Improved Solar Observing Optical Network (USAF/AFWA)                          |
| HuRAS                         | Humain Radio Astronomy Station   | ISN        | International Sunspot Number  |
| HXR                           | Hard x-rays  | ISS        | International Space Station   |
| Hz                            | Hertz (per second)   | ISWI       | International Space Weather Initiative  |
| I                             | Intensity  | ITRF       | International Terrestrial Reference Frame                                     |
| IAU                           | International Astronomical Union   | ITU        | International Telecom Unit  |
| IAGA                          | International Association of Geomagnetism and Aeronomy                   | IUGG       | International Union of Geodesy and Geophysics                                 |
| ICAO                          | International Civil Aviation Organization                                | J          | Joule   |
| ICME                          | Interplanetary CME   | JAXA       | Japan Aerospace eXploration Agency  |
| ICSU                          | International Council for Science  | JBP        | Jet Bright Point  |
| ICTSW                         | Interprogramme Coordination Team on Space Weather (WMO)                  | jHV        | jHelioViewer  |
|                               |  | JMG        | Joint Meteorological Group  |
|                               |  | JSWSC      | Journal of Space Weather and Space Climate                                    |



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|              |  |               |   |
|--------------|--|---------------|---|
| keV          | kilo electronvolt ( $10^3 \cdot 1.6 \cdot 10^{-19}$ Joule)                           | M-class       | Medium class satellite  |
| kHz          | kilo Hertz ( $10^3$ /second)   | M-class flare | Medium x-ray flare  |
| KNMI         | Koninklijk Nederlands Meteorologisch Instituut                                       | MAARBLE       | Monitoring, Analyzing and Assessing Radiation Belt Loss and Energization                                |
| $K_p$        | A geomagnetic index, ranging from 0 (quiet) to 9 (extremely severe storm)            | MAG           | Magnetometer instrument (ACE, DSCOVR)   |
| KSB          | Koninklijke Sterrenwacht van België  | MB            | Megabyte  |
| KUL          | Katholieke Universiteit Leuven   | MC            | Magnetic cloud  |
| kV           | kiloVolt ( $10^3$ Volt)  | MDI           | Michelson Doppler Imager (SOHO)   |
| $\lambda$    | wavelength   | MEGS-A        | Multiple EUV Grating Spectrograph A (SDO) - No longer operational                                       |
| L            | (1) Letter (manuscript); (2) Length; (3) Loss  | MEGS-B        | Multiple EUV Grating Spectrograph B (SDO)   |
| L1, L2       | GPS frequencies: L1 = 1575.42 MHz, L2 = 1227.60 MHz                                  | MEO           | Medium Earth orbit (2000 - <35.786 km)  |
| L1, ..., L5  | First, ..., fifth Lagrangian point   | MeV           | Mega electronvolt ( $10^6 \cdot 1.6 \cdot 10^{-19}$ Joule)  |
| LASCO        | Large Angle Spectrometric Coronagraph (SOHO); small (C2) and wide (C3) field of view | METOC         | Meteorology and Oceanography  |
| LDE          | Long Duration Event  | MF            | Medium frequency (300 kHz - 3 MHz)  |
| LDM-TEC      | Latitudinal Daily Mean TEC value   | MH            | Millionths of a solar hemisphere (1 MH = $\sim 3$ million km <sup>2</sup> ). Area Earth = $\sim 167$ MH |
| LEA          | Learmonth (RSTN, radio observatory)  | MHD           | Magnetohydrodynamics  |
| LEO          | Low Earth Orbit (160-2000 km altitude)   | MHF           | Medium High Frequency   |
| LF           | Low Frequency (30-300 kHz)   | MHz           | Megahertz ( $10^6$ /s)  |
| LH           | Left-handed  | MK            | Million degrees Kelvin  |
| LHCP         | Left Hand Circular Polarized   | mks           | Metric system based on the meter, kilogram, and second  |
| LIDAR        | Light Detection And Radar  | MLSO          | Mauna Loa Solar Observatory   |
| LMSAL        | Lockheed Martin Solar and Astrophysics Laboratory                                    | ms            | milliseconds ( $10^{-3}$ seconds)   |
| LOFAR        | Low-Frequency Array  | MSAS          | Multi-functional Satellite Augmentation System (Japan)  |
| LORAN        | Long Range Navigation  | MSCS          | McIntosh Sunspot Classification Scheme  |
| LOS          | Line Of Sight  | MSFC          | Marshall Space Flight Center (NASA)   |
| LPV          | Localizer performance with vertical guidance   | MSSL          | Mullard Space Science Laboratory  |
| LT           | Local Time   | mSv           | millisievert ( $10^{-3}$ J/kg ; dose equivalent radiation)  |
| LUF          | Lowest Useable Frequency   | MTI           | Moving Target Indication  |
| LVNL         | Luchtverkeersleiding Nederland   | MTOF          | Mass Tome-of-Flight sensor (SOHO)   |
| Ly- $\alpha$ | Lyman-alpha, a spectral line in the VUV at 121.6 nm                                  | MUF           | Maximum Useable Frequency   |
| LYRA         | Large Yield RAdiometer, formerly called Lyman Alpha Radiometer (PROBA2)              |               |   |
| $\mu$ m      | micrometer ( $10^{-6}$ meter)  |               |   |
| $\mu$ -waves | microwaves (300 MHz - 300 GHz)   |               |   |



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|                                    |   |                |   |
|------------------------------------|---|----------------|---|
| Mw                                 | Moment magnitude (earthquake)   | P <sub>t</sub> | Transmitted power   |
| v                                  | Frequency   | P2SC           | PROBA2 Science Center   |
| NASA                               | National Aeronautics and Space Administration                                     | PAL            | Palehua (RSTN, radio observatory)   |
| NATO                               | North-Atlantic Treaty Organization  | PAR            | Phased Array Radar  |
| NCAR                               | National Center for Atmospheric Research  | PCA            | Polar Cap Absorption  |
| NCEI                               | National Centers for Environmental Information                                    | PCAF           | PCA forecast  |
| N, N <sub>2</sub>                  | Nitrogen, molecular nitrogen  | PEA            | Post-eruption arcade  |
| N <sub>e</sub>                     | Electron density (e-m <sup>-3</sup> )   | PEN            | Penticton (DRAO, radio flux)  |
| Ne                                 | Neon  | PFSS           | Potential Field Source Surface particle (proton) flux unit: the number of particles registered per second, per square cm, and per steradian (1 pfu = 1 particle / cm <sup>-2</sup> s <sup>-1</sup> sr <sup>-1</sup> ) |
| NEO                                | Near Earth Objects  | pfu            |   |
| Net-TIDE                           | Pilot Network for Identification of Travelling Ionospheric Disturbances in Europe | PhD            | Doctor of Philosophy  |
| NGDC                               | National Geophysical Data Center (NOAA)   | PIL            | Polarity Inversion Line (neutral line)  |
| NIR                                | Near IR   | PLASTIC        | Plasma and Suprathermal Ion Composition (STEREO)  |
| NJIT                               | New Jersey Institute of Technology  | PoS, PotS      | Plane-of-the-Sky  |
| NM                                 | Neutron Monitor   | PRF            | (1) Preliminary Report and Forecast of Solar Geophysical Data (the "Weekly"); (2) Pulse Repetition Frequency  |
| nm                                 | nanometer (10 <sup>-9</sup> meter)  | PROBA          | PRoject for OnBoard Autonomy  |
| N <sub>m</sub> F <sub>2</sub>      | peak electron density of F <sub>2</sub> -layer                                    | PSR            | Primary Surveillance Radar  |
| NO                                 | Nitric oxide  | Q              | Quantity (e.g. e <sup>-</sup> , H <sub>2</sub> O,...)   |
| NOAA                               | National Oceanic and Atmospheric Administration (numbering of sunspots,...)       | Q&A            | Questions and Answers   |
| NRCan                              | Natural Resources Canada  | QS             | Quiet Sun   |
| NRH                                | Nançay Radioheliograph  | QZSS           | Quasi-Zenith Satellite System (Regional system; Japan)  |
| NRT                                | Near Real Time  | R              | (1) Radius ; (2) NOAA's scale for Radio Blackouts; (3) Range  |
| NSO                                | National Solar Observatory (USA)  | R&D            | Research and Development  |
| NSWP                               | National Space Weather Program (USA)  | RAC            | Radar Auroral Clutter   |
| nT                                 | nanotesla (10 <sup>-9</sup> Tesla)  | RAAF           | Royal Australian Air Force  |
| O, O <sub>2</sub> , O <sup>+</sup> | Oxygen, molecular oxygen, ionized oxygen  | RADAR          | RADio Detection And Ranging   |
| O <sub>3</sub>                     | Ozone   | RAE            | Royal Academy of Engineering (UK)   |
| OBEE                               | Outer belt electron enhancements  | RBR            | Radio burst (fixed frequency)   |
| Op                                 | Optical information (H-alpha classification)                                      | RC             | Ring Current  |
| ORFEES                             | Observation Radio Fréquences pour l'Etude des Eruptions Solaires                  | RCS            | Radar Cross Section   |
| OTH                                | Over The Horizon  | RF             | Radio Frequency   |
| P                                  | Power   | RFI            | Radio Frequency Interference  |
|                                    |   | RH             | Right-handed  |
|                                    |   | RHCP           | Right Hand Circular Polarized   |
|                                    |   | RHESSI         | Reuven Ramaty High Energy Solar Spectroscopic Imager  |
|                                    |   | Riometer       | Relative Ionospheric Opacity Meter (originally: Relative  |



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|           |   |          |  |
|-----------|---|----------|--|
|           | Ionospheric Opacity Meter for Extra-Terrestrial Emissions of Radio noise)       | SECCHI   | Sun Earth Connection Coronal and Heliospheric Investigation (STEREO) |
| RMI(B)    | Royal Meteorological Institute (of Belgium)                                     | SEE      | Single Event Effect  |
| ROB       | Royal Observatory of Belgium  | SEL      | Single-event latch-up  |
| ROT       | Rate of TEC change  | SEM      | Solar EUV Monitor (SOHO)   |
| RRR       | Rolling Requirement Review; WMO system for recording space weather requirements | SEP      | Solar Energetic Particle   |
| RSP       | Sweep-frequency radio burst   | SEPEM    | Solar Energetic Particle Environment Modelling (ESA)                 |
| RSTN      | Radio Solar Telescope Network (USAF)  | SES      | Sudden Enhancements of Signal  |
| RTSW      | Real-Time Solar Wind Data (ACE)   | SESC     | Space Environment Services Center                                    |
| RWC       | Regional Warning Center   | SEU      | Single Event Upset (bit flip)  |
| RX        | Receiver  | SFA      | Sudden Field Anomalies   |
| $\sigma$  | Radar cross section   | SFD      | Sudden Frequency Deviations  |
| S         | (1) Sub flare ; (2) NOAA's scale for Solar radiation storms                     | SFE      | Solar Flare Effect ("magnetic crochet")                              |
| $S_{min}$ | Minimal detectable signal   | SFU, sfu | Solar Flux Unit ( $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$ )      |
| S-band    | Radio waves with frequencies ranging from 2 to 4 GHz (IEEE)                     | SHF      | Super High Frequency   |
| S/C       | Spacecraft  | SID      | Sudden Ionospheric Disturbance                                       |
| S4        | Scintillation index (amplitude)   | SIDC     | Solar Influences Data analysis Center                                |
| SAA       | South Atlantic Anomaly  | SILSO    | Sunspot Index and Long-term Solar Observations                       |
| SACS      | Support to Aviation Control Service   | SIR      | Stream Interaction Region  |
| SAG       | Sagamore Hill (RSTN, radio observatory)   | SIS      | Solar Isotope Spectrometer (ACE)                                     |
| SAM       | Solar Aspect Monitor (SDO) - No longer operational                              | SITEC    | Sudden increase of total electron content                            |
| SAR       | (1) Superactive region; (2) Synthetic Aperture Radar                            | SLP      | Sweeping / Segmented / Single/ Split / Spherical Langmuir Probe      |
| SATCOM    | Satellite Communications  | SMART-L  | Signal Multibeam Acquisition Radar for Targeting, L-band             |
| SBAS      | Satellite-based augmentation systems  | SMM      | Solar Maximum Mission (1980-1989)                                    |
| SBC       | Sector Boundary Crossing  | SN       | Sunspot Number   |
| SC        | (1) Solar Cycle ; (2) Sudden Commencement                                       | SoFAST   | Solar Flare Automated Search Tool                                    |
| SC24      | Solar Cycle 24  | SOHO     | Solar & Heliospheric Observatory                                     |
| SCNA      | Sudden Cosmic Noise Absorption  | SOON     | Solar Observing Optical Network (USAF/AFWA)                          |
| SCOSTEP   | Scientific Committee on Solar Terrestrial Physics                               | SOT      | (1) Space Object Tracking ; (2) Solar Optical Telescope (Hinode)     |
| SDA       | Sudden Decrease of Atmospherics   | SOTERIA  | Solar-Terrestrial Investigations and Archives (EU/FP7)               |
| SDO       | Solar Dynamics Observatory  |          |  |
| SEA       | Sudden Enhancement of Atmospherics  |          |  |
| SEB       | Single-event burnout  |          |  |



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|               |  |             |  |
|---------------|--|-------------|--|
| SPA           | Sudden Phase Anomalies   | SWOP        | Space Weather Operations group (SIDC)  |
| SPE           | Solar Proton Event   |             |  |
| SPENVIS (-NG) | Space Environment Information System (- Next Generation)   | SWPC        | Space Weather Prediction Center  |
| SPWX          | Space Weather (military)   | SwRI        | Southwest Research Institute   |
| sr            | steradian  | SWRC        | Space Weather Research Center  |
| SRB           | Solar radio burst  | SWS         | Space Weather Services (Australia)   |
| SREM          | Standard Radiation Environment Monitor (INTEGRAL)  | SWSC        | Space Weather and Space Climate journal  |
| SSA           | Space Situational Awareness  | SWx         | Space weather  |
| SSB           | Solar Sector Boundary  | SXI         | Solar X-ray Imager (GOES12-15)   |
| SSC           | STEREO Science Center  | SXR         | Soft x-rays  |
| SSCC          | SSA Space Weather Coordination Centre  | SXT         | Soft x-rays telescope (Yohkoh)   |
| SSN           | SunSpot Number   | $\tau$      | Ionospheric slab thickness (meters)  |
| SSR           | (1) Solid state recorder; (2) Secondary Surveillance Radar   | TACSAT      | Tactical Satellite Communications  |
| ST-A, ST-B    | STEREO-A(head), STEREO-B(behind) spacecraft  | TEC         | Total Electron Content   |
| STAFF         | Solar Timelines viewer for AFFECTS   | TECu        | TEC unit ( $10^{16}e\cdot m^{-2}$ )  |
| STCE          | Solar-Terrestrial Centre of Excellence   | THz         | Terahertz ( $10^{12}/s$ )  |
| STEREO        | Solar-TERrestrial RELations Observatory  | TID         | Travelling Ionospheric Disturbance   |
| STIX          | X-ray Spectrometer / Telescope (SoLO)  | TIMED       | Thermosphere Ionosphere Mesosphere Energetics and Dynamics (NASA)              |
| SUVI          | Solar Ultraviolet Imager (GOES16-)   | TMR         | Triple-modular redundancy  |
| Sv            | Sievert (J/kg ; dose equivalent radiation: equivalent biological effect of the deposit of a joule of radiation energy in a kilogram of human tissue) | TRACE       | Transition Region and Coronal Explorer (1998-2010)                             |
| SVI           | San Vito (RSTN, radio observatory)   | TSI         | Total Solar Irradiance   |
| SW            | (1) Space weather ; (2) Solar wind   | TX          | Transmitter  |
| SWAP          | Sun Watcher using APS detector and image Processing (PROBA2)   | UAV         | Unmanned Aerial Vehicle  |
| SWAVES        | STEREO/WAVES instrument (STEREO)   | UHF         | Ultra High Frequency (300 MHz - 3 GHz)   |
| SWE           | Space WEather  | UK          | United Kingdom   |
| SWEPAM        | Solar Wind Electron, Proton, and Alpha Monitor (ACE)   | ULB         | Université Libre de Bruxelles  |
| SWF           | ShortWave Fadeouts   | UNCOPUOS    | United Nations Committee on the Peaceful Use of Outer Space                    |
| SWHV          | Space weather heliowiewer (JHV)  | UNOOSA      | United Nations Office for Outer Space Affairs                                  |
|               |  | URSI        | International Union of Radio Science – Union Radio-Scientifique Internationale |
|               |  | US(A)       | United States (of America)   |
|               |  | USAF        | United States Air Force  |
|               |  | USET        | Uccle Solar Equatorial Table (Coordinated) Universal Time                      |
|               |  | UT(C)       |  |
|               |  | UV          | Ultraviolet  |
|               |  | $\Phi_{60}$ | Scintillation index (phase)  |





# Space Weather Introductory Course

|                  |  |               |                                    |
|------------------|--|---------------|------------------------------------|
| V                | Volt   | WL            | White light                        |
| v                | speed  | WLF           | White-light flare                  |
| VEX              | Venus Express (2005-2015)                          | WMFR          | Weighted mean flare rate           |
| VHF              | Very High frequency (30-300 MHz)                   | WMO           | World Meteorological Organization  |
| VLF              | Very Low Frequency (3-30 kHz)                      | WP            | Work Package                       |
| VTEC             | Vertical TEC                                       | WRC           | World Radiation Center             |
| VUB              | Vrije Universiteit Brussel                         | WS            | Workshop                           |
| VUV              | Vacuum ultraviolet                                 | WTD           | waiting-time distribution          |
| W                | Watt   | X-class flare | Extreme x-ray flare                |
| W/m <sup>2</sup> | Watt per square meter                              | XRS           | X-ray sensor (GOES)                |
| WAAS             | Wide Area Augmentation System (USA)                | Yohkoh        | Japanese solar mission (1991-2001) |
| WAMS             | Wide Area Monitoring System                        | Zr            | Zirconium                          |
| WAVES            | Radio and plasma wave investigation (WIND, STEREO) | ZTD           | Zenith tropospheric Total Delays   |
| WDC              | World Data Center                                  |               |                                    |