SUDDEN IONOSPHERIC DISTURBANCES
Location, Size, and Description

L:\SOLAR\SID

381 files; 16.7 megabytes

Select SOLAR at the main menu, then SUDDEN IONOSPHERIC DISTURBANCES (SID)

Sudden Ionospheric Disturbances (SID)

Sudden Ionospheric Disturbances (SID) are caused by solar flare x-rays in the 1 to 10 Angstrom range. Solar flares can produce large increases of ionization in the D-region of the ionosphere over the daylit hemisphere of the Earth. SIDs typically begin simultaneously or a few minutes after the start of a solar flare. They can have a time duration somewhat longer than the flare and a rise time more rapid than the decay time.

Types of SIDs:

SCNA — Sudden Cosmic Noise Absorption is a riometer-detected sudden daytime absorption increase;

SEA — Sudden Enhancement of Atmospherics are increases in signal strength on wideband equipment operated in the VLF (10 to 50 kHz) frequency range;

SES — Sudden Enhancement of Signal, observed on VLF frequencies in the 15 to 50 kHz range are nearly identical to SEA except that the receivers are narrow-band receivers designed to pick up man-made VLF transmission. Like SEA, signal strength increase is the SID indicator;

SFD — Sudden Frequency Deviation is the sudden increase of high frequency radio waves which reaches a peak, and then decays back to the transmitting frequency;

SPA — Sudden Phase Anomaly is an abrupt shift in the phase of a radio signal on VLF frequencies received by ionospheric reflection;

SWF — Short Wave Fadeouts are abrupt decreases of radio signal strength observed at VLF frequencies.

The SID data include the date; beginning, maximum and ending times; type of SID; importance on a scale of 1- to 3+ where 3+ is the most important, and the definiteness on a scale of 1 to 5 where 5 is the most definite. Sometimes the monitored station is also included.

To access the SID data, the user should select SOLAR in the main menu, and then SID. Data files cover the time period March 1958 to August 1989. Several format changes have occurred during this time period.

The BROWSE mode will allow you to view the data on the screen for the months selected. The GRAPH mode will show you the monthly counts, monthly smoothed counts, and smoothed sunspot numbers in certain combinations.

Report Format for SID Data 80-Character Records
(Current — several format changes have occurred.)

Columns	Fmt	Description
1- 2	I2	Data code; always 40
3- 5	3X	Blank
6- 11	I6	Date (yymmdd)
12- 13	2X	Blank
14- 17	I4	Start time; UT hours and minutes event began
18	A1	Start time qualifier; D=after, E=before, U=uncertain
19- 22	I4	End time; UT hours and minutes event ended
23	A1	End time qualifier; D=after, E=before, U=uncertain
24- 27	I4	Max time; UT hours and minutes of event maximum
28	A1	Max time qualifier; D=after, E=before, U=uncertain
29 -30	A2	Dropout rate of Short Wave Fadeout; S=Sudden, SL=Slow, G=Gradual, *=No Data
31- 32	A2	Importance of Short Wave Fadeout; sign in column 32. SWFs are observed on fieldstrength recordings of distant HF transmitters. *
33- 35	I3	Percentage decrease of Sudden Cosmic Noise Absorption
36- 37	A2	Importance of Sudden Cosmic Noise Absorption; sign in column 37. SCNAs measure decreases in galactic radio noise at about 18 to 25 MHz

38- 39	A2	Importance of Sudden Enhancement or Decrease in Atmospherics; sign in column 39. SEAs and SDAs measure rises and falls in LF atmospherics at about 27 kHz *
40- 43	A4	Phase shift in degrees of Sudden Phase Anomaly at LF or VLF; sign in column 40. SPAs can have either a positive or negative phase change.
44- 46	A3	Importance of Sudden Enhancement of Signal Strength; sign in column 46. SESs are observed on fieldstrength recordings of extremely stable VLF transmissions *
47- 49	F2.1	Doppler frequency shift in Hz of Sudden Frequency Deviation; sign in column 47. SFDs measure the rapid change in received frequency of HF radio waves reflected from the E and F1 layers
50- 51	A2	Definiteness; an integer value from 0 to 5; subjective estimate of confidence in identifying event
52- 55	A4	Call letters and frequency (in kHz or MHz) of monitored transmitter. The field consists of either 2 letters and 2 numbers or 3 letters and 1 number
56- 69	4X	Blank
70- 74	A5	Station code
75- 80	6X	Blank

* Importance: from 1-,1,1+ (weakest) to 3-,3,3+ (strongest).

Some Transmitters Monitored by Stations Reporting SIDs

SID Code	Call Ltrs	Frequency	Location
OM14	Omega	13.6 kHz	Aldra, Norway
SS21	NSS	21 MHz	Annapolis, Maryland, USA
BA	NBA		Balboa, Canal Zone
AA17	NAA	17 MHz	Cutler, Maine, USA
DMF2		1.539MHz	Deutchlandfunk at Mainflingen
VL19	WWVL	9 MHz	Fort Collins, Colorado, USA
VL20	WWVL	20 MHz	Fort Collins, Colorado, USA
OM10	Omega	10.2 kHz	Haiku, Hawaii, USA
WWI8	WWI	8 MHz	Havana, Illinois, USA

Transmitters Monitored by Stations Reporting SIDs

SID Code	Call Ltrs	Frequency	Location
WI11	WWI	11 MHz	Havana, Illinois, USA
WI13	WWI	13 MHz	Havana, Illinois, USA
PM23	NPM	23 MHz	Honolulu, Hawaii, USA
LK18	NLK	18 MHz	Jim Creek, Washington, USA
PG18	NPG	18 MHz	Jim Creek, Washington, USA
ND11		11.3 kHz	North Dakota
WC22	NWC	22 MHz	Northwest Cape, Australia
LUX6		6.090MHz	Radio Luxembourg
MC10		9.82 MHz	Radio Mineria de Chile
RE11		11.3 kHz	Reunion
BR16	GBR	16 MHz	Rugby, England
OM12	Omega	12.0 kHz	Trinidad, West Indies
VH10	WWVH	10 MHz	University of Hawaii
WVH5	WWVH	5 MHz	University of Hawaii