3-day Space Weather Conditions (SUPARCO)

Friday, January 05, 2024, 12:15 PST
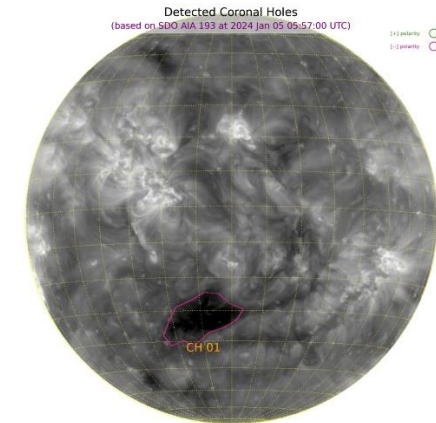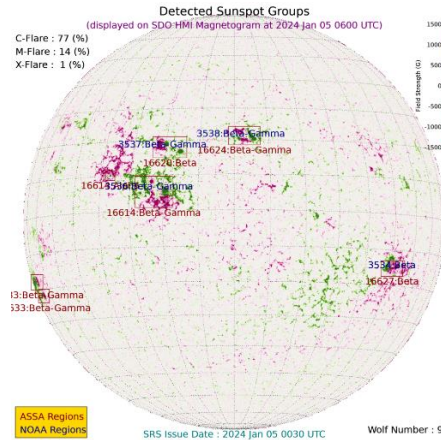
SUPARCO

LOCAL CURRENT IONOSPHERIC CONDITIONS (SON)			
DATE	**5-Jan-24 (noon)**	**6-Jan-24 (noon)**	**7-Jan-24 (noon)**
foF2	10.3 MHz	10.0 MHz	9.7 MHz
h'F2	285 km	280 km	276 km
TEC	42 TECU	40 TECU	38 TECU

Maximum Usable Frequency (MUF) and Optimum Traffic Frequency (FOT) for various distances								
Distance (km)	**100**	**200**	**400**	**600**	**800**	**1000**	**1500**	**3000**
MUF (MHz) for 3 days (05 Jan – 07 Jan)	10.5	10.9	12.4	14.4	16.4	18.7	23.5	27.7
	10.2	10.7	11.8	14.0	16.1	18.4	23.4	27.4
	9.9	10.0	11.3	12.4	15.4	17.0	22.5	26.7
FOT (MHz) for 3 days (05 Jan – 07 Jan)	8.8	9.3	10.9	11.6	13.9	15.5	19.9	23.6
	8.6	9.1	10.7	11.5	13.7	15.3	19.7	23.4
	8.1	8.5	10.4	10.5	13.2	15.0	19.2	23.3

Local ionospheric conditions are normal as compared to the predicted monthly median MUF.

LOCAL GEOMAGNETIC CONDITIONS			
K-index	0 (Quiet)	Quiet to unsettled geomagnetic activity is expected.	Quiet geomagnetic activity is expected.
F (SON/ISB)	45516/50026 nT	45526±10 /50038±20 nT	45526±10/50038±20 nT

The local geomagnetic field is Quiet at the moment.

SOLAR CONDITIONS			
SN	64	125 (SSN-predicted)	110 (SSN-predicted)
F 10.7	126 sfu	182 sfu	174 sfu
V$_{sw}$	459.8 km/s (Varied in the past 12 hrs between 382 & 494 km/s)	Low to moderate levels of solar windspeed may prevail.	Low to moderate levels of solar windspeed may prevail.
Solar flares	C1.1 (max. flare in the past C3, 1731 UT)	Moderate to high levels of solar activity expected.	Moderate levels of solar activity expected.
IMF Bt	+3.8 nT (varied in the past 12 hrs between +3.1 nT & +4.0 nT)	Expected to vary between positive and negative sectors.	Expected to vary between positive and negative sectors.
Bz	+1.8 nT (varied in the past 12 hrs between -3.4 nT & +0.7 nT)		

Solar conditions are at moderate to high levels with background X-ray flux at C-class levels.

Daily Sun: 5 January 2024

| There are three active regions AR3536, AR3537 and AR3538 present on the Sun capable of producing strong M and X-class solar flares having chances of 14% and 1% respectively.

01 Coronal Hole (CH) is detected on the solar disk. | Detected Sunspot Groups
(displayed on SDO HMI Magnetogram at 2024 Jan 05 0600 UTC)

C-Flare : 77 (%)
M-Flare : 14 (%)
X-Flare : 1 (%)

3538:Beta-Gamma
3537:Beta-Gamma 16624:Beta-Gamma
16620:Beta
16614 16614:Beta-Gamma
16614:Beta-Gamma
3534:Beta
16627:Beta
I3:Beta Gamma
I533:Beta-Gamma

ASSA Regions
NOAA Regions
SRS Issue Date : 2024 Jan 05 0030 UTC   Wolf Number : 97 | Detected Coronal Holes
(based on SDO AIA 193 at 2024 Jan 05 05:57:00 UTC)

CH 01 |

2-Day Conditions
Solar activity is expected to be at moderate to high levels. Multiple M-class flares have already occurred from the regions mentioned. In case of more M/X-class solar flares, minor to moderate radio blackouts may be observed. Low to moderate solar windspeed and quiet to unsettled geomagnetic activity is expected over the weekend. Normal ionospheric conditions are expected for the next 2 days. It is advised to use the frequency ranges mentioned in the ionospheric section.

For information on radio blackout levels, please follow the link:
http://www.swpc.noaa.gov/noaa-scales-explanation

Sonmiani (SON): 25.2º N, 66.75º E
Islamabad (ISB): 33.7º N, 73.13º E

DEFINITIONS OF TERMINOLOGIES USED IN THIS SUMMARY	
foF2	Maximum frequency of F2-layer of the ionosphere
h'F2	Virtual height of the F2-layer
MUF	Maximum usable frequency for 3000 km
K-index	Local index defining geomagnetic conditions
Declination	Planetary A index defining geomagnetic conditions, predicted value during geomagnetic unsettled Conditions
F	Magnitude of the total geomagnetic field vector (unit in nano Teslas)
SON, difference	Sonmiani Geomagnetic Observatory mean value, difference limit from night time value of quiet conditions: 25-30 nT, max: 260 nT
ISB	Islamabad Geomagnetic Observatory mean value
SN	Relative sunspot numbers
V_{SW}	Solar Wind Speed (km/s)
F10.7	Solar radio flux at 2.8 GHz (10.7 cm wavelength)
sfu	Solar flux unit (defines the solar radio 10.7 cm flux)
Solar Flare	Could be B, C, M and X depending upon the intensity of x-rays being emitted (each type has further 10 classes based on amount of energy released by the flare)
IMF	Interplanetary magnetic field (the source of which is the Sun)
Bt	Total IMF (unit in Nano Teslas)
Bz	Vertical component of IMF (could be north/upward/positive or south/downward/negative) (unit in nano Teslas)
AR	Active Regions on the sun currently in view
CME	Coronal Mass Ejection
CH	Coronal Hole
KASI	Korean Astronomy & Space Science Institute
SWFs	Short-wave fadeouts, caused by M/X class flares on the daylit side of the hemisphere absorbing lower Frequencies and hampering HF communication.
SSN-predicted	Smooth Sunspot Number-it is an estimated value using a mathematical relation to forecast it.