3-day Space Weather Conditions (SUPARCO)

Friday, March 15, 2024, 12:00 PST
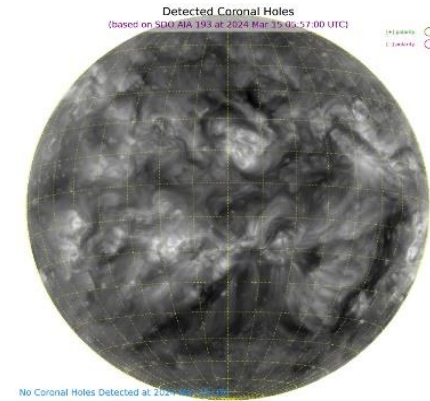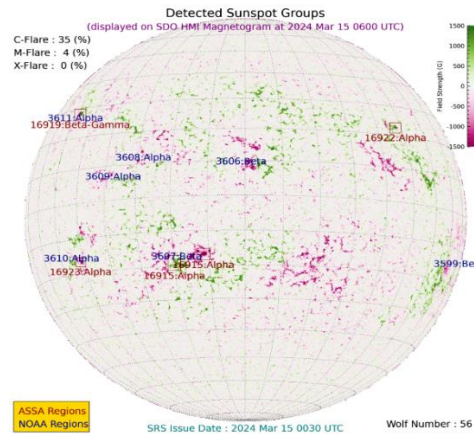
	LOCAL CURRENT IONOSPHERIC CONDITIONS (SON)		
DATE	**15-Mar-24 (noon)**	**16-Mar-24 (noon)**	**17-Mar-24 (noon)**
foF2	10.0 MHz	10.3 MHz	9.2 MHz
h'F2	280 km	285 km	273 km
TEC	40 TECU	43 TECU	37 TECU

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 (15 Mar– 17 Mar)	10.2	10.7	11.8	14.0	16.1	18.4	22.4	25.5
	10.5	10.9	12.4	14.4	16.4	18.7	22.5	25.7
	9.4	9.7	10.4	13.4	15.4	17.7	21.5	24.2
FOT (MHz) for 3 days (15 Mar– 17 Mar)	8.1	8.5	10.4	11.2	13.2	15.0	19.2	21.5
	8.6	9.1	10.7	11.7	13.7	15.3	19.7	21.8
	8.0	8.2	8.8	10.7	13.1	14.8	18.3	20.6

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

	LOCAL GEOMAGNETIC CONDITIONS		
K-index	1 (Quiet)	Quiet geomagnetic activity is expected.	Quiet geomagnetic activity is expected.
F (SON/ISB)	45506/50516 nT	45516±10 /50525±20 nT	45516±10/50525±20 nT

The local geomagnetic field is Quiet at the moment.

	SOLAR CONDITIONS		
SN	88	95 (SSN-predicted)	103 (SSN-predicted)
F 10.7	128 sfu	135 sfu	142 sfu
V$_{sw}$	406.2 km/s (Varied in the past 12 hrs between 361 & 658 km/s)	Low to moderate levels of solar windspeed may prevail.	Low levels of solar windspeed may prevail.
Solar flares	C5.9 (max. flare in the past C5, 0619 UT)	Low to moderate levels of solar activity expected.	Low levels of solar activity expected.
IMF Bt	+4.6 nT (varied in the past 12 hrs between +5.2 nT & +7.4 nT)	Expected to vary between positive and negative sectors.	Expected to vary between positive and negative sectors.
Bz	-2.8 nT (varied in the past 12 hrs between -6.9 nT & +3.5 nT)		

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

Daily Sun: 15 March 2024

There is no active region present on the Sun capable of producing strong solar flares.

No Coronal Hole (CH) is detected on the solar disk.

Detected Sunspot Groups
(displayed on SDO HMI Magnetogram at 2024 Mar 15 0600 UTC)
C-Flare : 35 (%)
M-Flare : 4 (%)
X-Flare : 0 (%)
ASSA Regions
NOAA Regions
SRS Issue Date : 2024 Mar 15 0030 UTC
Wolf Number : 56

Detected Coronal Holes
(based on SDO AIA 193 at 2024 Mar 15 07:00 UTC)
No Coronal Holes Detected at 2024

2-Day Conditions

Solar activity is expected to be at low to moderate levels. In case of solar flares, shortwave fadeouts or radio blackouts may be observed.

Low to moderate solar windspeed and quiet 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

ANNEXURE

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.