

3-day Space Weather Conditions (SUPARCO)

Friday, February 11, 2022, 15:05PST



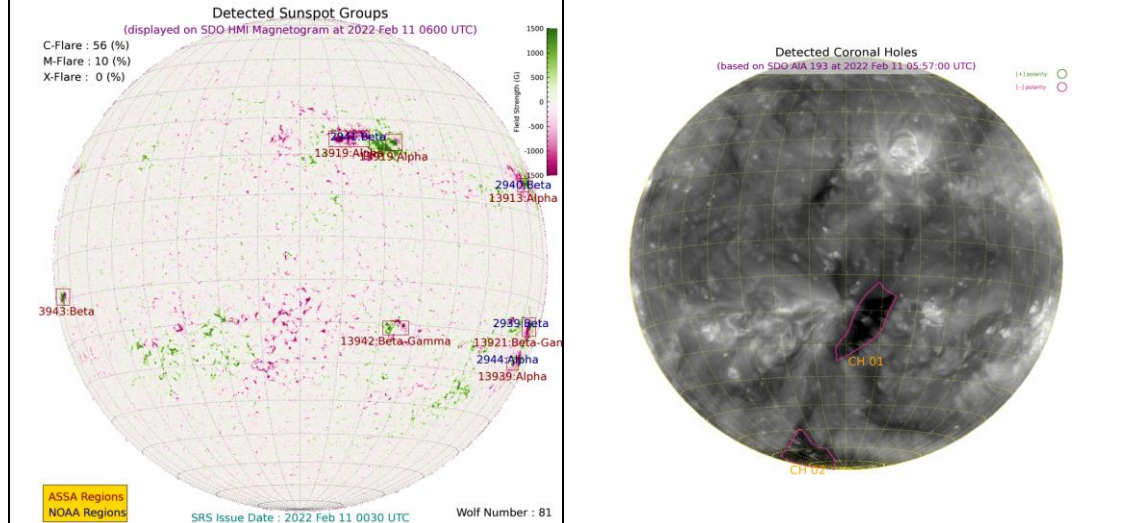
LOCAL CURRENT IONOSPHERIC CONDITIONS OVER SONMIANI								
DATE	11-Feb-22(noon)			12-Feb-22 (noon)			13-Feb-22 (noon)	
foF2	11.2 MHz			11.0 MHz			10.8 MHz	
h'F2	280 km			278 km			276 km	
TEC	27 TECU			28 TECU			29 TECU	
Maximum Usable Frequency (MUF) and Optimum Traffic Frequency (FOT) for various distances								
Distance (km)	100	200	400	600	800	1000	1500	3000
MUF (MHz) for 3 days (11 Feb-13 Feb)	9.1	9.5	11.0	13.1	15.4	17.7	23.0	31.3
	8.9	9.4	10.9	12.9	15.2	17.5	22.7	30.9
	8.8	9.2	10.7	12.7	15.0	17.2	22.4	30.4
FOT (MHz) for 3 days (11 Feb-13 Feb)	7.7	8.1	9.4	11.1	13.1	15.1	19.6	26.6
	7.6	8.0	9.2	11.0	12.9	14.9	19.3	26.2
	7.5	7.8	9.1	10.8	12.7	14.7	19.1	25.9
Local ionospheric conditions are normal with slightly enhanced MUF as compared to the nearly-predicted monthly median MUF.								
LOCAL GEOMAGNETIC CONDITIONS OVER PAKISTAN								
K-index	2			Quiet geomagnetic activity expected			Quiet geomagnetic activity expected	
F (SON/ISB)	45538/50059nT			45538±10 /50059±20 nT			45538±10/50059±20 nT	
The local geomagnetic field is quite at the moment.								
SOLAR CONDITIONS								
SN	78			75 (SSN-predicted)			73 (SSN-predicted)	
F 10.7	126 sfu			124 sfu			123 sfu	
V _{sw}	370.9 km/sec (varied in the past 12 hrs between 369 & 450 km/s)			Low solar wind speed is expected.			Low solar wind speed is expected.	
Solar flares	B3.8 (max. flare in the past 24 hrs: C1 0958 UT Feb10)			Low to Moderate levels of solar activity is expected.			Low to Moderate levels of solar activity is expected.	

IMF	11.3nT (varied in the past 12 hrs between 10.37 & 12.40 nT)	Expected to vary between positive and negative sectors.	Expected to vary between positive and negative sectors.
Bt			
Bz	9.2 nT (varied in the past 12 hrs between -9.27 & +9.03 nT)		

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

Daily Sun: 11 February 2022

There is no active region on the solar limb capable of producing strong solar flares.
02 Coronal Holes (CHs) are detected on the solar disk.



2-Day Conditions

Solar activity is expected to be at low to moderate levels with background X-ray flux at B-class levels.
Low solar wind speed and quiet geomagnetic conditions are expected over the weekend.
Normal HF 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>

Acknowledgements:

Images source: Solar Dynamics Observatory-SDO) both images showing the Solar disk and Coronal Holes have been processed at SUPARCO using Automatic Solar Synoptic Analyzer (ASSA), developed jointly by the Korean Space Weather Centre of the Radio Research Agency (RRA) & Space Environment Laboratory (SELab).

Data sources: The planetary indices and solar data are taken from the URLs below:

- <http://www.spaceweather.go.kr>
- <http://www.sws.bom.gov.au>

Sonmiani (SON): 25.2° N, 66.75° E
Islamabad (ISB): 33.7° N, 73.13° 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, <u>difference limit</u> from night time value of quiet conditions: 25-30 nT, max: 260 nT
ISP	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)
B _t	Total IMF (unit in Nano Teslas)
B _z	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 daylight 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.