

3-day Space Weather Conditions (SUPARCO)

Friday, March 13, 2020, 12:36 PST

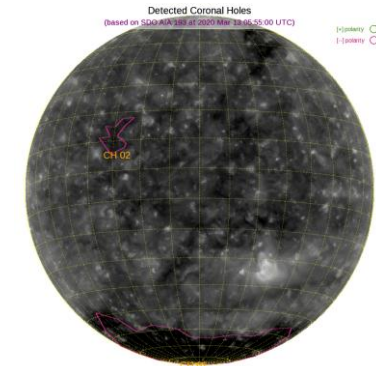
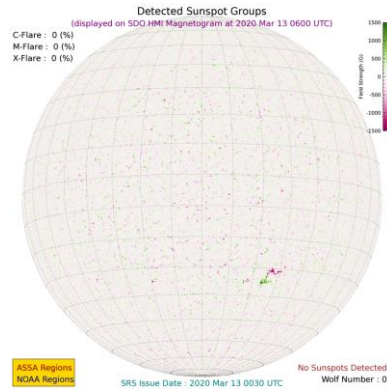


LOCAL CURRENT IONOSPHERIC CONDITIONS OVER PAKISTAN ^a																								
DATE	13-Mar-20 (noon)						14-Mar-20 (noon)						15-Mar-20 (noon)											
foF2	7.9 MHz						8.1 MHz						8.5 MHz											
h'F2	288 km						293 km						295 km											
TEC	13 TECU						15 TECU						17 TECU											
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 (13, 14, & 15 Mar)	8.0	8.2	8.6	8.4	8.6	9.0	9.6	9.8	10.2	11.3	11.5	12.0	13.1	13.3	13.9	15.1	15.3	15.9	19.5	19.7	20.6	26.5	26.9	28.1
FOT (MHz) for 3 days (13, 14, & 15 Mar)	6.8	7.0	7.3	7.1	7.3	7.6	8.1	8.3	8.7	9.6	9.7	10.2	11.2	11.3	11.8	12.8	13.0	13.6	16.6	16.8	17.5	22.5	22.9	23.9
Local ionospheric conditions are nominal with normal MUF conditions. It is advised to use a higher frequency band in case of HF communication difficulty.																								
LOCAL GEOMAGNETIC CONDITIONS OVER PAKISTAN ^{ab}																								
K-index	3						3						3											
F	45401/49930 nT						45380±20/49910±20 nT						45380±20/49931±20 nT											
D	0.96/1.66 degrees						0.98/1.66 degrees						0.98/1.66 degrees											
The local geomagnetic field is quiet at the moment.																								
SOLAR CONDITIONS																								
SN	0						5						5											
F 10.7	71 sfu						70 sfu						70 sfu											
V _{sw}	403 km/sec (varied in the past 12 hrs between 338 & 428 km/s)						Slightly enhanced solar wind expected						Slightly enhanced solar wind expected											
Solar flares	A 0.0 (max. flare in the past 24 hrs: A 9.0 at 1205 UT Feb 20)						Very low levels of solar flare activity expected						Very low levels of solar flare activity expected											
IMF B _t	6.0 nT (varied in the past 12 hrs between 1.0 & 8.0 nT)						Expected to vary between positive and negative sectors.						Expected to vary between positive and negative sectors											
B _z	+2.0 nT (varied in the past 12 hrs between -6.0 & +4.0 nT)																							
Solar conditions are at <u>very low</u> levels with background X-ray flux at A-class levels. Local HF working frequencies are <u>normal</u> as compared to monthly average predicted values.																								

Daily Sun: 13 March 2020

There are no active regions on the Sun as the Sun is currently spotless.

02 Coronal Holes (CHs) are detected on the solar disk with negative polarity.



2-Day Conditions

Solar activity is expected to remain at low levels over the weekend. Solar wind speed is expected to be mostly near its nominal level. Some minor enhancement in solar wind speed may occur due to small patchy coronal holes reaching geoeffective location on the solar disk. Geomagnetic activity is expected to be mostly at quiet to unsettled levels. 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>

<http://www.solarmonitor.org>

^aSonmiani (SON): 25.2° N, 66.75° E

^bIslamabad (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 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.