



2-Day Space Weather Conditions (SUPARCO)

Wednesday, December 30, 2020, 15:26 PST

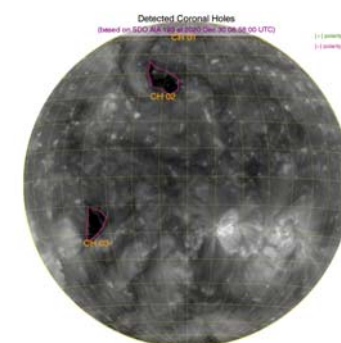
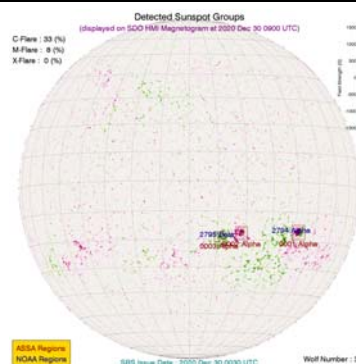
LOCAL CURRENT IONOSPHERIC CONDITIONS OVER PAKISTAN ^a								
DATE	30-Dec-20 (noon)				31-Dec-20 (noon)			
foF2	6.3 MHz				6.0 MHz			
h'F2	253 km				273 km			
TEC	12 TECU				12 TECU			
Maximum Usable Frequency (MUF) and Optimum Traffic Frequency (FOT) for various distances								
Distance (Km)	100	200	400	600	800	1000	1500	3000
MUF (MHz) for 2 days(30 & 31 Dec)	6.4	6.8	8.0	9.6	11.4	13.2	17.1	22.7
	6.1	6.4	7.4	8.8	10.3	11.9	15.4	20.8
FOT (MHz) for 2 days(30 & 31 Dec)	5.5	5.8	6.8	8.2	9.7	11.2	14.5	19.3
	5.2	5.4	6.3	7.5	8.8	10.1	13.1	17.6
Local ionospheric conditions are nominal with slightly depressed 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	2				Quiet geomagnetic activity expected			
F	45443/50011 nT				45440±10/49995±10nT			
D	0.98/1.60 degrees				0.96/1.62 degrees			
The local geomagnetic field is quiet at the moment.								
SOLAR CONDITIONS								
SN	26				27 (SSN-predicted)			
F 10.7	84 sfu				85 sfu			
V_{sw}	502 km/sec (varied in the past 12 hrs between 451 & 541 km/s)				Moderate solar wind speed expected			
Solar flares	B 1.2 (max. flare in the past 24 hrs: B 6.0 2104 UT Dec 29)				Low levels of solar activity expected with a slight chance for C-class flares			
IMF Bt	4.3 nT (varied in the past 12 hrs between 4.3 & 6.6 nT)				Expected to vary between positive and negative sectors.			
Bz	+3.9 nT (varied in the past 12 hrs between -3.5 & +3.9 nT)							

Solar conditions are at **low** levels with background X-ray flux at B-class levels. Local HF working frequencies are **normal** as compared to monthly average predicted values.

Daily Sun: 30 December 2020

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

03 Coronal Holes (CHs) are detected on the solar disk.



1-Day Conditions

Solar activity is expected to be at low levels with slight chance for C-class flare. Moderate solar wind speed and quiet geomagnetic conditions are expected. 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
Vsw	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.