3-day Space Weather Conditions (SUPARCO)

Friday, November 08, 2024, 14:57 PST

SUPARCO

Radio Blackouts			Solar Radiation Storms			Geomagnetic Storms		
-24 Hr	Current	Predicted	-24 Hr	Current	Predicted	-24 Hr	Current	Predicted
R1	R0	R1 – R2	S0	S0	S0 – S1	G0	G0	G0

DATE	LOCAL CURRENT IONOSPHERIC CONDITIONS (SON)							
	8-Nov-24 (noon)		2-Nov-24 (noon)			3-Nov-24 (noon)		
foF2	15.0 MHz		14.5 MHz			14.1 MHz		
h'F2	320 km		310 km			300 km		
TEC	84 TECU		78 TECU			74 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 (08 Nov – 10 Nov)	15.2	15.7	17.6	20.4	23.5	26.7	30.2	34.3
	14.8	15.2	17.2	20.0	23.1	26.3	29.9	33.9
	14.3	14.9	16.9	19.7	22.9	26.2	29.7	33.7
FOT (MHz) for 3 days (08 Nov – 10 Nov)	12.9	13.4	15.0	17.3	19.9	22.7	25.7	29.1
	12.5	12.9	14.6	17.0	19.6	22.4	25.5	28.8
	12.2	12.6	14.4	16.8	19.5	22.2	25.2	28.7
Local ionospheric conditions are enhanced as compared to the predicted monthly median MUF.								
LOCAL GEOMAGNETIC CONDITIONS								
K-index	2 (Quiet)		Quiet to unsettled geomagnetic activity is expected.			Quiet geomagnetic activity is expected.		
F (SON/ISB)	45675/50515 nT		45682±10 /50520±20 nT			45682±10/50520±20 nT		
The local geomagnetic field is quiet at the moment.								
SOLAR CONDITIONS								
SN	164		160 (SSN-predicted)			152 (SSN-predicted)		
F 10.7	260 sfu		250 sfu			240 sfu		
V_{sw}	353.6 km/s (Varied in the past 12 hrs between 378 & 570 km/s)		Low to moderate levels of solar windspeed may prevail.			Low to moderate levels of solar windspeed may prevail.		
Solar flares	C2.7 (max. flare in the past (X2, 2120 UT)		High level of solar activity is expected.			Moderate to high level of solar activity is expected.		

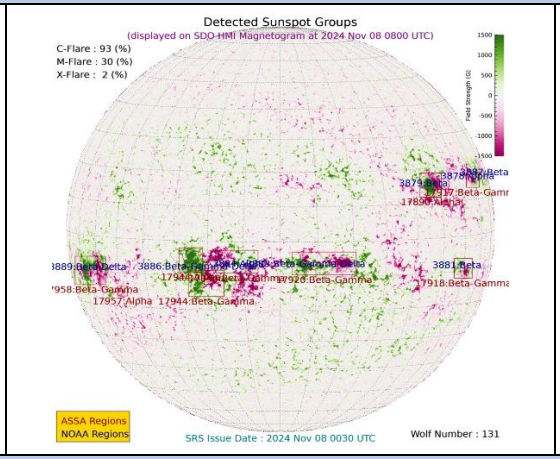
IMF **Bt** **Bz**	+5.63 nT (varied in the past 12 hrs between +2.7 nT & +7.63 nT) -1.2 nT (varied in the past 12 hrs between -2.29 nT & +5.73 nT)	Expected to vary between positive and negative sectors.	Expected to vary between positive and negative sectors.

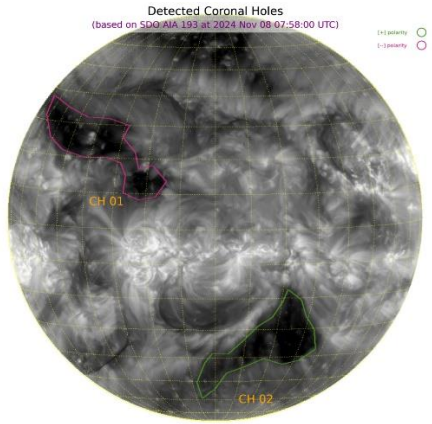
Solar conditions are at high levels with background X-ray flux at C-class levels.

Daily Sun: 8 November 2024

There are three active regions AR3883, AR3886 and AR3889 present on the Sun capable of producing strong M and X-class solar flares having chances of 30% and 2% respectively.

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





2-Day Conditions

- Solar activity is expected to be at high levels.
- Multiple M/X-class solar flares, have already occurred from the regions mentioned above causing R1 – R2 levels radio blackouts.
- In case of more M/X-class solar flares, R1 – R2 levels radio blackouts are expected.
- Moderate to slightly elevated solar windspeed is expected due to the presence of coronal holes.
- Geomagnetic activity is expected to be at quiet level.
- Enhanced ionospheric conditions are expected for the next 2 days due to increased solar activity levels. It is advised to use the frequency ranges mentioned in the ionospheric section.

Credits:

Solar conditions courtesy to SOHO, DSCOVR and GOES-16 missions.
NOAA SWPC is acknowledged for solar radio flux conditions.
Korean Space Weather Centre is acknowledged for solar disk and coronal hole images.

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, 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.

RSG SCALES

Radio Blackouts				
Minor	**Moderate**	**Strong**	**Severe**	**Extreme**
R1	**R2**	**R3**	**R4**	**R5**

Solar Radiation Storms				
Minor	**Moderate**	**Strong**	**Severe**	**Extreme**
S1	**S2**	**S3**	**S4**	**S5**

Geomegnatic Storms				
Minor	**Moderate**	**Strong**	**Severe**	**Extreme**
G1	**G2**	**G3**	**G4**	**G5**