

3-day Space Weather Conditions (SUPARCO)

Friday, July 18, 2025, 01:30 PST



SUPARCO

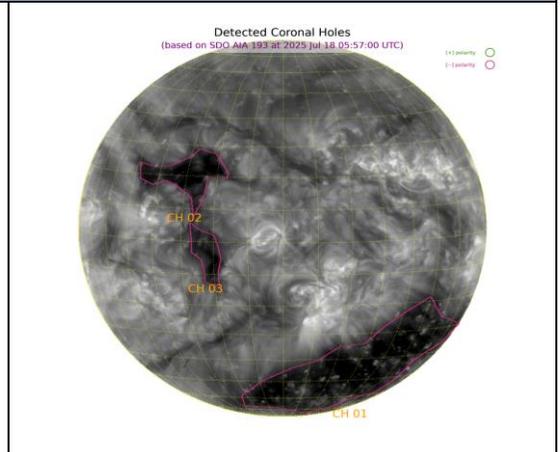
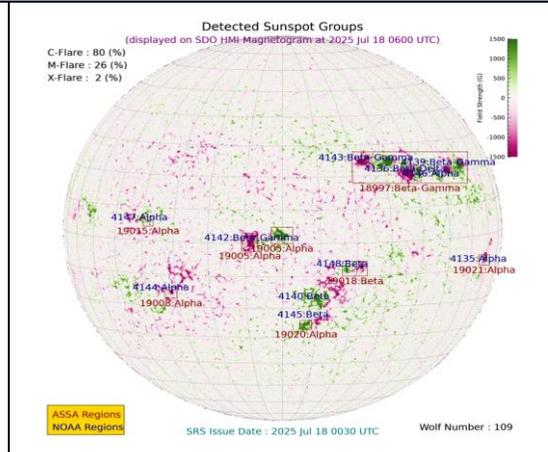
Radio Blackouts			Solar Radiation Storms			Geomagnetic Storms		
-24 Hr	Current	Predicted	-24 Hr	Current	Predicted	-24 Hr	Current	Predicted
R1 – R2	R0 / R1	R1 – R2	S0	S0	S0	G0	G0	G0

LOCAL CURRENT IONOSPHERIC CONDITIONS (SON)								
DATE	18-Jul-25 (noon)		19-Jul-25 (noon)			20-Jul-25 (noon)		
foF2	9.2 MHz		9.0 MHz			8.8 MHz		
h'F2	363 km		330 km			318 km		
TEC	60 TECU		57 TECU			54 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 (18 Jul – 20 Jul)	9.4	10.1	11.9	13.4	14.7	16.9	20.5	23.6
	9.2	9.9	11.7	13.2	14.5	16.7	20.3	23.4
	9.0	9.6	11.4	12.9	14.1	16.4	20.0	23.0
FOT (MHz) for 3 days (18 Jul – 20 Jul)	8.0	8.6	10.1	11.4	12.5	14.4	17.4	20.1
	7.8	8.4	9.8	11.2	12.3	14.1	17.1	19.9
	7.7	8.1	9.4	10.9	12.0	13.7	16.8	19.6
Local ionospheric conditions are slightly depressed as compared to the predicted monthly median MUF.								
LOCAL GEOMAGNETIC CONDITIONS								
K-index	2 (Quiet)		Quiet geomagnetic activity is expected.			Quiet geomagnetic activity is expected.		
F (SON/ISB)	45670/50500 nT		45672±10 /50505±20 nT			45675±10/50510±20 nT		
The local geomagnetic field is quiet at the moment								
SOLAR CONDITIONS								
SN	178		172 (SSN-predicted)			166 (SSN-predicted)		
F 10.7	156 sfu		140 sfu			128 sfu		
V _{sw}	574.3 km/s (Varied in the past 12 hrs between 509 & 780 km/s)		Moderate to slightly elevated levels of solar wind speed may prevail.			Moderate to slightly elevated levels of solar wind speed may prevail.		
Solar flares	C1.1 (max. flare in the past (C5, 0928 UT)		Low to moderate levels of solar activity is expected.			Low to moderate levels of solar activity is expected.		
IMF Bt	+6.44 nT (varied in the past 12 hrs between +6.41 nT & +7.67 nT)		Expected to vary between positive and negative sectors.			Expected to vary between positive and negative sectors.		
Bz	+2.52 nT (varied in the past 12 hrs between +0.85 nT & +4.16 nT)							
Solar conditions are at low to moderate levels with background X-ray flux at C-class levels.								

Daily Sun: 18 July 2025

There are four active regions AR4142, AR4143, AR4146 and AR4149 present on the Sun capable of producing strong M and X-class solar flares having chances of 26% and 2% respectively.

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



2-Day Conditions

- Solar activity is expected to be at low to moderate levels.
- In case of M/X-class solar flares, minor to moderate level radio blackouts are expected.
- Moderate to slightly elevated levels of solar wind speed is expected due to presence of coronal holes.
- Quiet levels of geomagnetic activity is expected.
- Slightly depressed ionospheric conditions are expected for the next 2 days. 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, <u>difference limit</u> 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)
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 day lit 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

<u>Radio Blackouts</u>				
Minor R1	Moderate R2	Strong R3	Severe R4	Extreme R5

<u>Solar Radiation Storms</u>				
Minor S1	Moderate S2	Strong S3	Severe S4	Extreme S5

<u>Geomagnetic Storms</u>				
Minor G1	Moderate G2	Strong G3	Severe G4	Extreme G5