3-day Space Weather Conditions (SUPARCO)

Friday, March 14, 2025, 11:40 PST

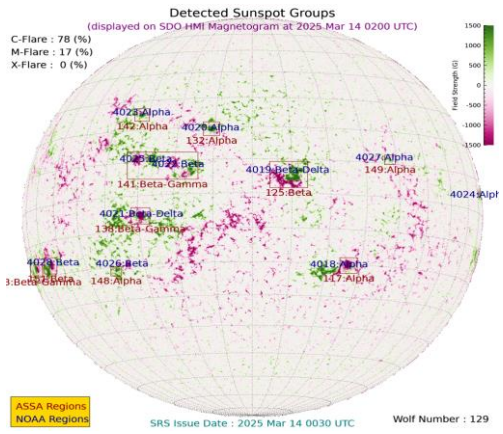
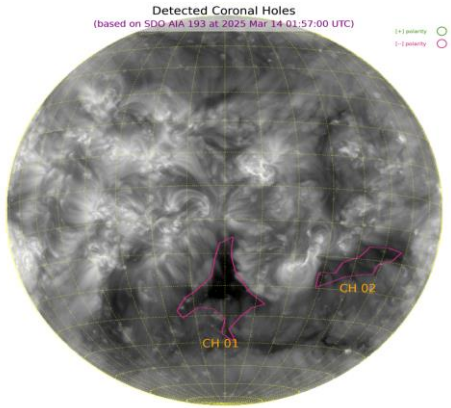
SUPARCO

Radio Blackouts			Solar Radiation Storms			Geomagnetic Storms		
-24 Hr	Current	Predicted	-24 Hr	Current	Predicted	-24 Hr	Current	Predicted
R0 – R1	R0	R1 – R2	S0	S0	S0 / S1	G1 – G2	G0	G0 / G1

LOCAL CURRENT IONOSPHERIC CONDITIONS (SON)								
DATE	**14-Mar-25 (noon)**			**15-Mar-25 (noon)**			**16-Mar-25 (noon)**	
foF2	11.6 MHz			11.9 MHz			12.2 MHz	
h'F2	310 km			315 km			290 km	
TEC	24 TECU			27 TECU			30 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 (14 Mar – 16 Mar)	11.8	12.0	13.6	15.6	17.8	20.1	22.5	23.5
	12.0	12.5	13.9	15.7	17.9	20.3	22.7	23.7
	12.4	12.7	14.0	15.9	18.1	20.5	22.8	23.9
FOT (MHz) for 3 days (14 Mar – 16 Mar)	10.0	10.2	11.6	13.3	15.1	17.1	19.1	20.0
	10.2	10.6	11.8	13.4	15.3	17.3	19.3	20.1
	10.5	10.8	11.9	13.5	15.4	17.4	19.4	20.3
Local ionospheric conditions are normal 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)	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	160	165 (SSN-predicted)	170 (SSN-predicted)
F 10.7	175 sfu	182 sfu	190 sfu
V_{sw}	498.8 km/s (Varied in the past 12 hrs between 295 & 755 km/s)	Low to moderate levels of solar wind speed may prevail.	Low to moderate levels of solar wind speed may prevail.
Solar flares	C1.4 (max. flare in the past (C7, 1935 UT)	Low to moderate levels of solar activity is expected.	Low to moderate levels of solar activity is expected.
IMF **Bt** **Bz**	+7.23 nT (varied in the past 12 hrs between +6.28 nT & +8.05 nT) +0.91 nT (varied in the past 12 hrs between -6.42 nT & +4.36 nT)	Expected to vary between positive and negative sectors.	Expected to vary between positive and negative sectors.
Solar conditions are at low to moderate levels with background X-ray flux at C-class levels.			

Daily Sun: 14 March 2025		
There are two active regions AR4019 and AR4021 present on the Sun capable of producing strong C and M-class solar flares having chances of 78% and 17% respectively. 02 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. ▪ Low to moderate solar wind speed is expected due to the presence of coronal hole. ▪ Geomagnetic activity is expected to be at quiet to unsettled levels. ▪ Normal 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, 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 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

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**