3-day Space Weather Conditions (SUPARCO)

Friday, March 04, 2022, 14:18PST
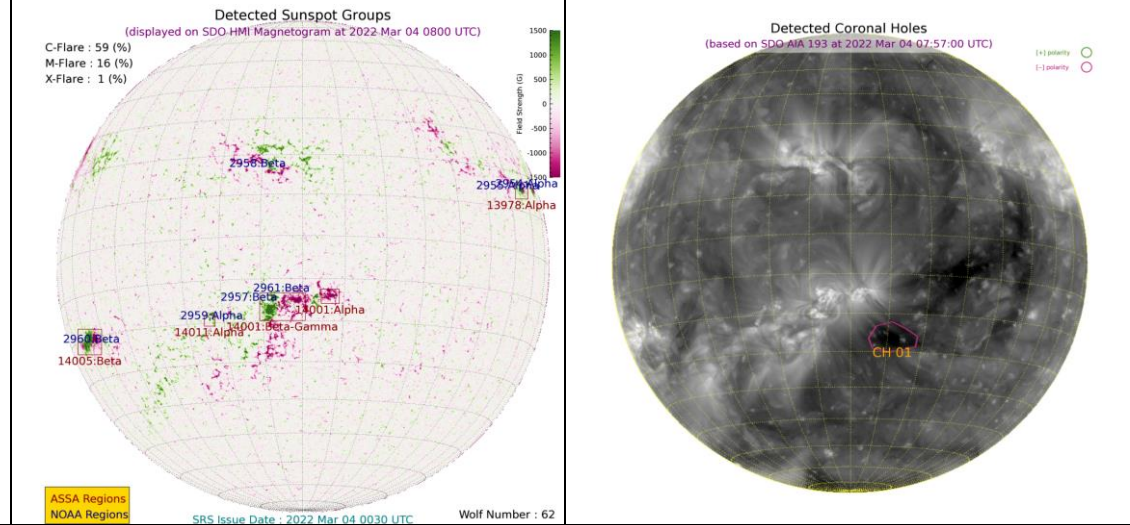
SUPARCO

LOCAL CURRENT IONOSPHERIC CONDITIONS (SON)			
DATE	**04-Mar-22(noon)**	**05-March-22 (noon)**	**06-March-22 (noon)**
foF2	11.1 MHz	10.9 MHz	10.7 MHz
h'F2	280 km	277 km	274 km
TEC	50 TECU	49 TECU	48 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 (04 March-06 March)	11.3	11.8	13.4	15.6	18.1	20.5	26.2	31.2
	11.1	11.6	13.2	15.4	17.9	20.3	26.0	31.2
	10.9	11.4	12.9	15.1	17.6	20.0	25.8	31.0
FOT (MHz) for 3 days (04 March-06 March)	9.6	10.3	11.4	13.3	15.4	17.4	22.3	26.5
	9.4	9.9	11.2	13.0	15.2	17.3	22.1	26.5
	9.3	9.7	10.9	12.8	14.9	17.0	21.9	26.3

Local ionospheric conditions are normal with slightly enhanced MUF as compared to the predicted monthly median MUF.

LOCAL GEOMAGNETIC CONDITIONS			
K-index	2	Quiet geomagnetic activity expected	Quiet geomagnetic activity expected
F (SON/ISB)	45567/50064nT	45572±10 /50067±20 nT	45572±10/50067±20 nT

The local geomagnetic field is quite at the moment.

SOLAR CONDITIONS			
SN	92	90 (SSN-predicted)	88 (SSN-predicted)
F 10.7	111 sfu	108 sfu	105 sfu
V_SW	406.3 km/s (varied in the past 12 hrs between 362 & 467 km/s)	Low solar wind speed is expected.	Low solar wind speed is expected.
Solar flares	B9.5 (max. flare in the past 24 hrs: C3 2155 UT Mar 03)	Moderate level of solar activity is expected.	Moderate level of solar activity is expected.
IMF Bt **Bz**	4.7 nT (varied in the past 12 hrs between 3.0 nT & 6.8 nT) 1.2 nT (varied in the past 12 hrs between -2.2 & +2.3 nT)	Expected to vary between positive and negative sectors.	Expected to vary between positive and negative sectors.

Solar conditions are at moderate levels with background X-ray flux at B-class levels.

Daily Sun: 4 March 2022

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

01 Coronal Hole (CH) is detected on the solar disk.

Detected Sunspot Groups
(displayed on SDO-HMI Magnetogram at 2022 Mar 04 0800 UTC)

C-Flare : 59 (%)
M-Flare : 16 (%)
X-Flare : 1 (%)

Field Strength (G)

2958:Beta
2959:Alpha
13978:Alpha
2961:Beta
2957:Beta
14001:Alpha
2959:Alpha
14011:Alpha 14001:Beta-Gamma
2960:Beta
14005:Beta

ASSA Regions
NOAA Regions

SRS Issue Date : 2022 Mar 04 0030 UTC   Wolf Number : 62

Detected Coronal Holes
(based on SDO-AIA 193 at 2022 Mar 04 07:57:00 UTC)

[+] polarity ○
[−] polarity ○

CH 01

2-Day Conditions

Solar activity is expected to be at moderate levels with background X-ray flux at B-class levels.

Low solar wind speed with brief periods of enhancement may be expected due to the presence of coronal hole. Quiet geomagnetic conditions are expected over the weekend.

Normal ionospheric conditions are expected for the next 2 days. 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

Sonmiani (SON): 25.2º N, 66.75º E
Islamabad (ISB): 33.7º N, 73.13º 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
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.