

3-day Space Weather Conditions (SUPARCO)

Friday, April 01, 2022, 12:21PST



| LOCAL CURRENT IONOSPHERIC CONDITIONS OVER SONMIANI | | | | | | | | |
|--|--|------|------|--|------|------|--|------|
| DATE | 1-Apr-22(noon) | | | 2-Apr-22 (noon) | | | 3-Apr-22 (noon) | |
| foF2 | 11.2 MHz | | | 11.1 MHz | | | 11.0 MHz | |
| h'F2 | 323 km | | | 317 km | | | 310 km | |
| TEC | 49 TECU | | | 48 TECU | | | 47 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 (01 Apr-03 Apr) | 11.3 | 11.7 | 13.1 | 15.1 | 17.4 | 19.8 | 25.4 | 35.2 |
| | 11.2 | 11.6 | 13.0 | 15.1 | 17.3 | 19.7 | 25.4 | 35.2 |
| | 11.1 | 11.5 | 12.9 | 15.0 | 17.1 | 19.5 | 25.2 | 35.0 |
| FOT (MHz) for 3 days (01 Apr-03 Apr) | 9.6 | 10.0 | 11.2 | 12.8 | 14.8 | 16.8 | 21.6 | 29.9 |
| | 9.5 | 9.9 | 11.1 | 12.8 | 14.7 | 16.8 | 21.4 | 29.9 |
| | 9.5 | 9.8 | 11.0 | 12.6 | 14.5 | 16.6 | 21.3 | 29.7 |
| Local ionospheric conditions are slightly enhanced as compared to the nearly-predicted monthly median MUF. | | | | | | | | |
| LOCAL GEOMAGNETIC CONDITIONS OVER PAKISTAN | | | | | | | | |
| K-index | 2 | | | Quiet geomagnetic activity expected | | | Quiet geomagnetic activity expected | |
| F (SON/ISB) | 45570/50080nT | | | 45580±10 /50087±20 nT | | | 45580±10/50087±20 nT | |
| The local geomagnetic field is quite at the moment. | | | | | | | | |
| SOLAR CONDITIONS | | | | | | | | |
| SN | 84 | | | 82 (SSN-predicted) | | | 80 (SSN-predicted) | |
| F 10.7 | 149 sfu | | | 146 sfu | | | 144 sfu | |
| V_{sw} | 456.8 km/sec (varied in the past 12 hrs between 447 & 627 km/s) | | | Moderate solar wind speed is expected. | | | Moderate solar wind speed is expected. | |
| Solar flares | C3.7 (max. flare in the past 24 hrs: M9 1835 UT Mar 31) | | | Moderate levels of solar activity is expected. | | | Moderate levels of solar activity is expected. | |

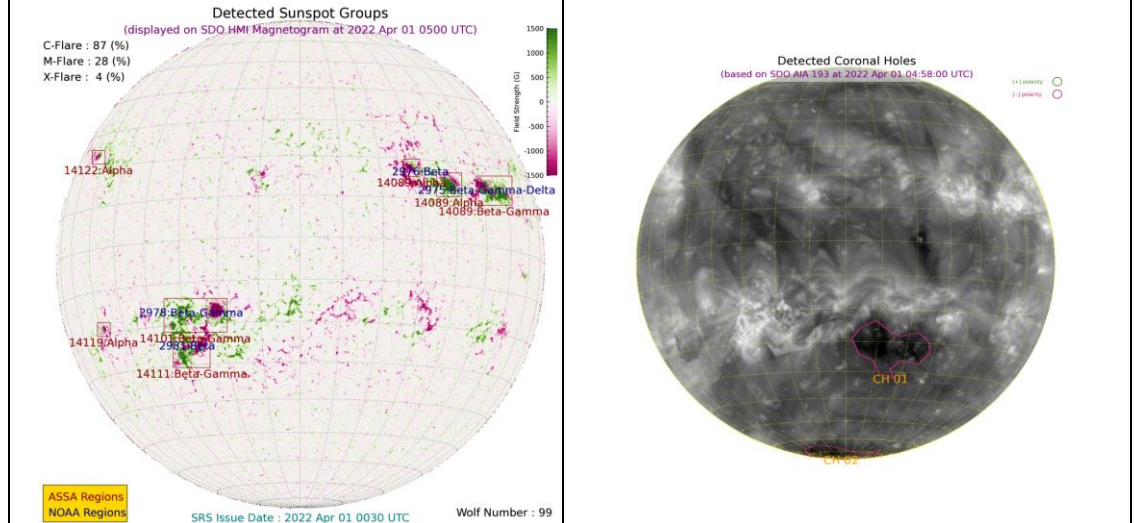
| | | | |
|------------|---|---|---|
| IMF | 17.9 nT (varied in the past 12 hrs between 18.1 & 23.0 nT) | Expected to vary between positive and negative sectors. | Expected to vary between positive and negative sectors. |
| Bt | | | |
| Bz | -3.5 nT (varied in the past 12 hrs between -3.3 & +16.5 nT) | | |

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

Daily Sun: 1 April 2022

There are three active regions present on the solar limb capable of producing C and M-Class solar flares.

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



2-Day Conditions

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

Due to the presence of active regions C and M-Class flares may be witnessed.

Radio blackouts are also expected.

Moderate solar wind speed is expected due to CME impact. Geomagnetic conditions are expected to be quiet to active over the weekend.

Slightly enhanced 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): 25.2° 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 |
| ISP | 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 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. |