

3-day Space Weather Conditions (SUPARCO)

Friday, October 14, 2022, 12:34 PST

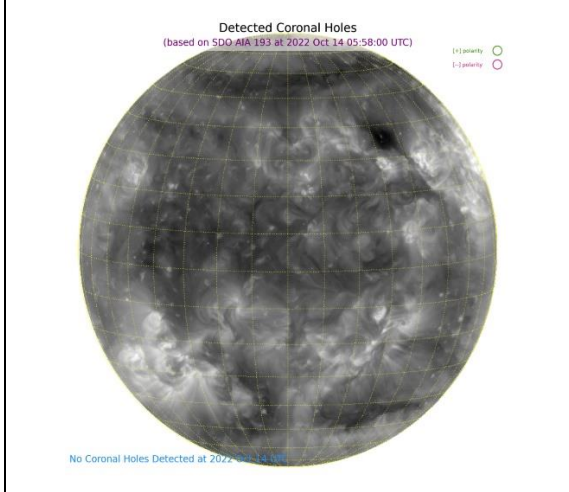
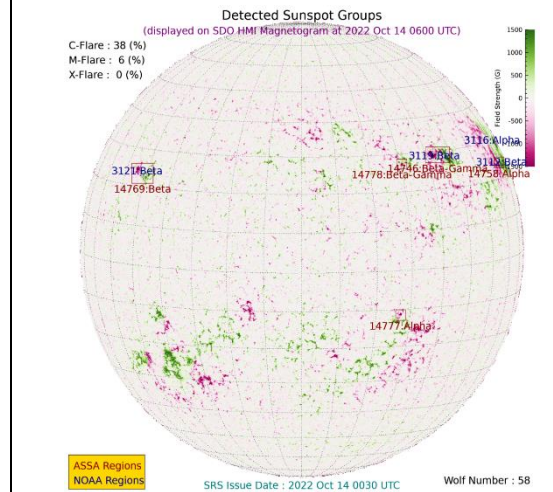


| LOCAL CURRENT IONOSPHERIC CONDITIONS (SON) | | | | | | | | |
|--|--|------|------|---|------|------|---|------|
| DATE | 14-Oct-22(noon) | | | 15-Oct-22 (noon) | | | 16-Oct-22 (noon) | |
| foF2 | 10.6 MHz | | | 10.3 MHz | | | 9.9 MHz | |
| h'F2 | 255 km | | | 248 km | | | 234 km | |
| TEC | 60 TECU | | | 59 TECU | | | 58 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 Oct - 16 Oct) | 10.7 | 11.2 | 13.0 | 15.5 | 18.1 | 20.7 | 26.6 | 31.4 |
| | 10.4 | 10.9 | 12.7 | 15.3 | 17.8 | 20.4 | 26.4 | 30.9 |
| | 10.0 | 10.6 | 12.5 | 15.2 | 17.5 | 20.3 | 26.3 | 30.6 |
| FOT (MHz) for 3 days (14 Oct - 16 Oct) | 9.1 | 9.5 | 11.1 | 13.2 | 15.4 | 17.6 | 22.6 | 26.7 |
| | 8.8 | 9.3 | 10.8 | 13.0 | 15.1 | 17.3 | 22.4 | 26.3 |
| | 8.5 | 9.0 | 10.6 | 12.9 | 14.9 | 17.2 | 22.3 | 26.0 |
| Local ionospheric conditions are normal as compared to the predicted monthly median MUF. | | | | | | | | |
| LOCAL GEOMAGNETIC CONDITIONS | | | | | | | | |
| K-index | 2 | | | Quiet geomagnetic activity is expected. | | | Quiet geomagnetic activity is expected. | |
| F (SON/ISB) | 45544/50054 nT | | | 45554±10 /50060±20 nT | | | 45554±10/50060±20 nT | |
| The local geomagnetic field is quiet at the moment. | | | | | | | | |
| SOLAR CONDITIONS | | | | | | | | |
| SN | 57 | | | 54 (SSN-predicted) | | | 49 (SSN-predicted) | |
| F 10.7 | 141 sfu | | | 135 sfu | | | 128 sfu | |
| V _{sw} | 336.6 km/s (Varied in the past 12 hrs between 292 & 619 km/s) | | | Low levels of solar wind speed may prevail. | | | Low levels of solar wind speed may prevail. | |
| Solar flares | B7.6 (max. flare in the past 24 hrs: C4, 0917 UT) | | | Low levels of solar activity expected. | | | Low levels of solar activity expected. | |
| IMF B _t B _z | 11.7 nT (varied in the past 12 hrs between 4.8 nT & 12.1 nT) -11.1 nT (varied in the past 12 hrs between -12.3 nT & 1.3 nT) | | | Expected to remain in negative sectors. | | | Expected to vary between positive and negative sectors. | |
| Solar conditions are at low levels with background X-ray flux at C-class levels. | | | | | | | | |

Daily Sun: 14 October 2022

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

No Coronal Hole (CH) is detected on the solar limb.



2-Day Conditions

Solar activity is expected to be at low levels with background X-ray flux at B-class levels. In case of solar flares, shortwave fadeouts may occur.

Low solar wind speed and quiet geomagnetic activity is expected to prevail 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): 25.2° 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 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. |