# Effects of geomagnetic storm on equatorial ionization during 27 February-1 March, 2014

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**Abstract**

The paper inspects the effects of a G2 class geomagnetic storm that occurred during 27 February- 1 March, 2014 on the equatorial ionization. This storm is observed following a Coronal Mass Ejection (CME) from a sunspot AR1967 on 26 February. An enhancement of solar wind speed is observed on 27 February, 2014 (483 km/sec). The maximum southward component of Interplanetary Magnetic Field (IMF) is observed around 21 UT of 27 February (12 nT). This interconnects with Earth's magnetic field and develops the main phase of a geomagnetic storm on the same day. The storm continues through 28 February and quiet-time ionospheric condition is recovered on 1 March. The effects of the storm on equatorial ionization is observed at Brasilia (15.95°S, 47.88°W geographic; 9.40°N, 21.13°E geomagnetic), Addis Ababa (9.04°N, 38.77°E geographic; 0.18°N, 110.47°E geomagnetic) and Colombo (6.89°N, 79.87°E geographic; 1.57°S, 151.57°E geomagnetic). An enhancement of TEC is observed during main phase of the geomagnetic storm at these stations. Increment in diurnal peak is observed on 28 February (14 TECU at 10 UT at Addis Ababa) while a decrement of diurnal peak TEC is observed during the recovery phase of the storm (15 TECU at 10 UT at Addis Ababa). Post-sunset ionospheric scintillation is inhibited at Brasilia on 28 February.

# EFFECTS OF GEOMAGNETIC STORM ON EQUATORIAL IONIZATION DURING 27 FEBRUARY-1 MARCH, 2014


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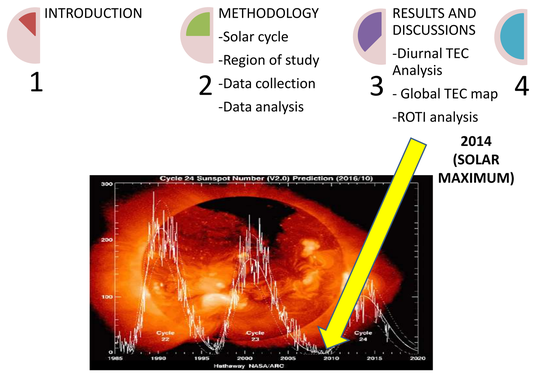
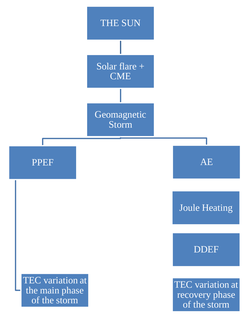
**Abstract ID: 413612**


## Outline

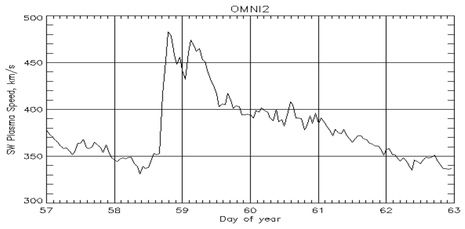


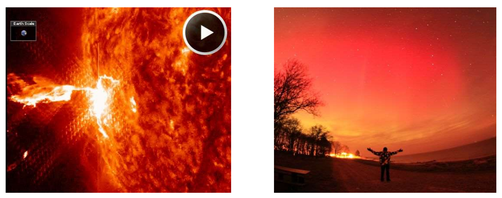

## Methodology

| Data | Resources |
|---|---|
| - MAGNETIC INDICES | https://omniweb.gsfc.nasa.gov<br>http://isgi.unistra.fr/geomagnetic_indices.php<br>http://magnetometers.bc.edu/index.php/78-magnetometers/78-home |
| - SOLAR INDICES | https://solarscience.msfc.nasa.gov/SunspotCycle.shtml<br>https://omniweb.gsfc.nasa.gov |
| - TEC DATA | http://www.igs.org/about/data-centers<br>ftp://cddis.gsfc.nasa.gov/gnss/data/daily/ |

**Variation of solar wind speed during 26 Feb – 3 Mar 2014**
**Source: https://omniweb.gsfc.nasa.gov**



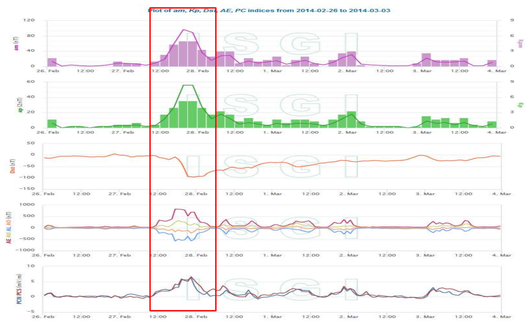

**CME from sunspot ar1967 observed on 26 February 2014 and G2 class magnetic storm on 27 February 2014**



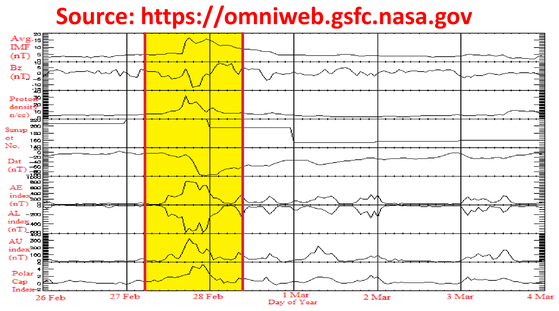
Source: www.spaceweather.com

**Magnetic indices during 26 February – 3 March, 2014**

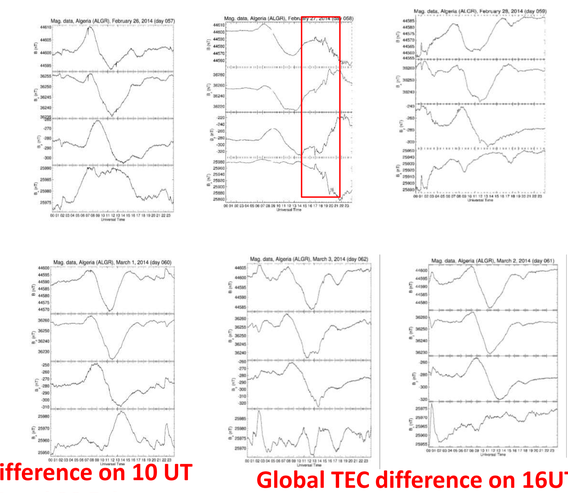
Source: http://isgi.unistra.fr/geomagnetic_indices.php



**Solar and magnetic indices during 26 February – 3 March, 2014**
**Source: https://omniweb.gsfc.nasa.gov**

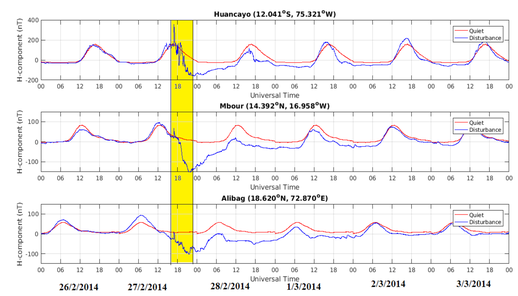



**Variation of geomagnetic field during 26 February - 2 March, 2014**

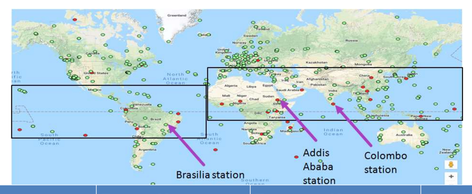


Samba-amber Magnetometers Data center Algeria (28°n 3°e geographic 15.23°n, 76.58°e Geomagnetic) Variation of b, bz, Bx, by indices with Universal time

**Variation of H-component of earth's magnetic field during 26 February-3 March 2014**

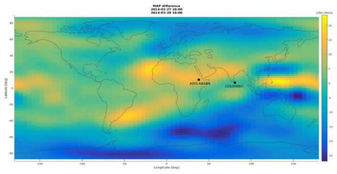



**Region of Study**

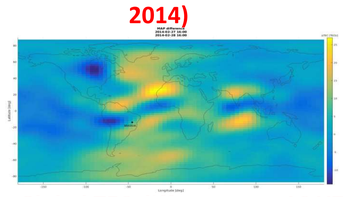



| Station | Country | Lat_Geogr | Long_Geogr | Lat_Geomag | Long_Geomag |
|---|---|---|---|---|---|
| Braz | Ethiopia | -15,95 | -47,88 | 9,40 | 21,13 |
| Adis | Brazil | 9,04 | 38,77 | 0,18 | 110.47 |
| Sgoc | Sri Lanka | 6,89 | 79,87 | -1.57 | 151,57 |

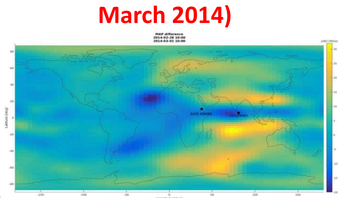
**Global TEC difference on 10 UT (between 27 and 28 February, 2014)**



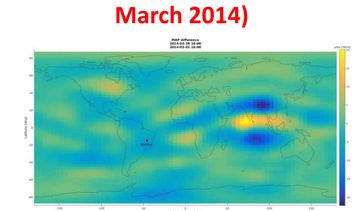
**Global TEC difference on 16UT (between 27 and 28 February, 2014)**



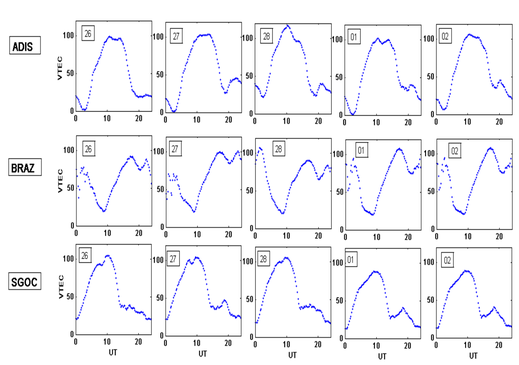
**Global TEC difference on 10 UT (between 28 February, and 1 March 2014)**



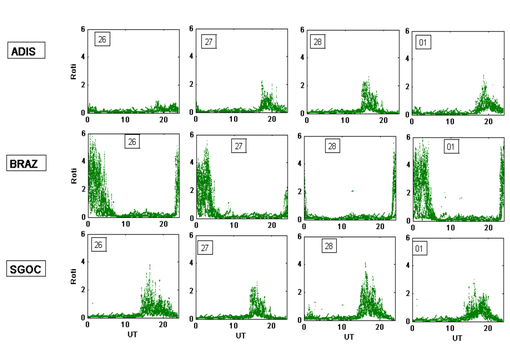
**Global TEC difference on 16 UT (between 28 February, and 1 March 2014)**



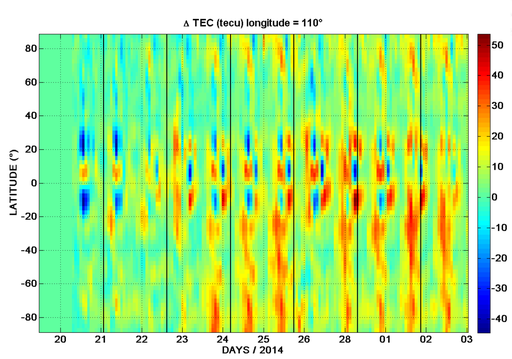
**Comparison of diurnal VTEC over the duration of 26 February - 2 March, 2014 from 1) Adis Ababa (Ethiopia) 2) Brasilia (Brazil) 3) Colombo (Sri Lanka)**




**Comparison of diurnal ROTI Index over the duration of 26 February - 2 March, 2014 from 1) Adis Ababa (Ethiopia) 2) Brasilia (Brazil) 3) Colombo (Sri Lanka)**




**Latitudinal variation of δTEC (TECU) during 20 February – 3 March, 2014 along 110° longitude**




## Conclusion

A geomagnetic storm is observed (main phase is on 17-23 UT, 27 February, 2014).
TEC Enhancement is observed at the main phase of geomagnetic storm (starting 17 UT, 27 February, 2014).
Increment of diurnal peak TEC is observed on 28 February, 2014.
Diurnal TEC peak decreases on 1 March 2014, at the recovery phase of geomagnetic storm.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