Space Weather Service Mexico
Special Report

SCiESMEX

Servicio de Clima Espacial - MX

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INSTITUTO de GEOFÍSICA
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Special Report Post-event: Event June 21th 2015

Pos-tevent abstract:

The day 2015/06/21 at 01:02 UT ocurred a solar flare (class M2.0) in the active region (AR) 12371. The AR was located at N12E16 in solar-disk coordinates. The solar flare had associated a coronal mass ejection (CME) detected at 02:48TU. The CME was Earth-directed with initial speed of 1225 km/s; hence the possibility of leading shock wave was high.

According the avialble data, the shock wave arrived at Earth's neighborhood by 2015/06/22 At 18:00 UT. It appears that the CME arrived by 2015/06/23 at 00:00 UT with a leading speed of 700 km/s.

The SciESMEX's forecasting for this event was:

Travel time (Sun-Earth): 44.34 h

Arrival speed: 765 km/s

We expected the shock arrival two hours before the CME's arrival. Hencefore, The CME would arrive by 2015/06/22 at 21:20 UT with a speed of 765km/s. Meanwhile the shock would arrive the same date at 19:20 UT.

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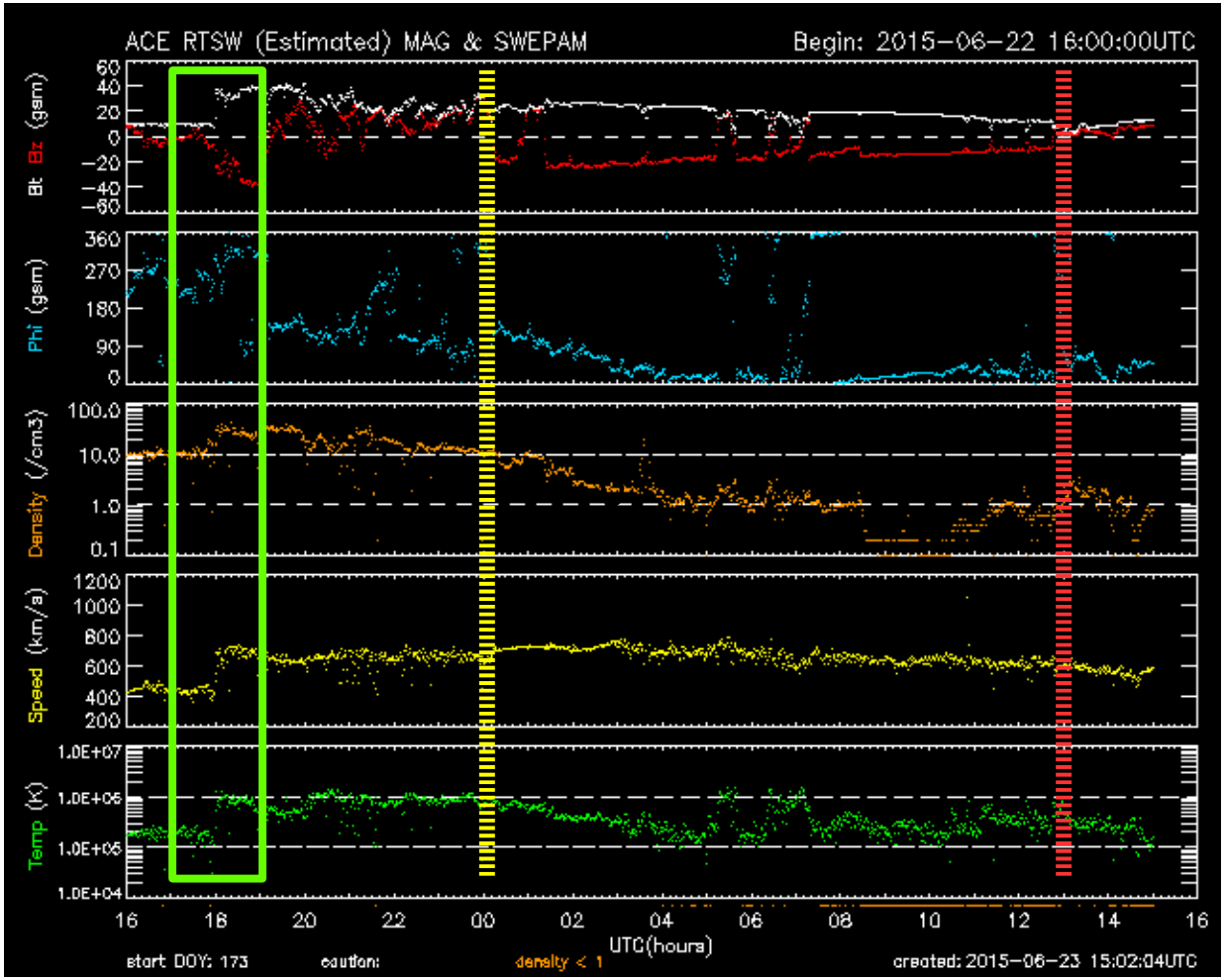
Solar wind properties measured near The Earth's orbit. From top to bottom: magnetic field, magnetic field polarity proton density, speed and proton Temperature. On the horizontal axis runs the time from 16:00 hours of June 22 to 16:00 of June 23.

The fast increment in all the solar wind properties inclosed by a green rectanglel point out the shock's arrival. Meanwhile The dotted yellow line marks out the CME arrival. Finally, the dotted red line Marks oit the possible boundary of the The CME.



créditos: http://www.swpc.noaa.gov

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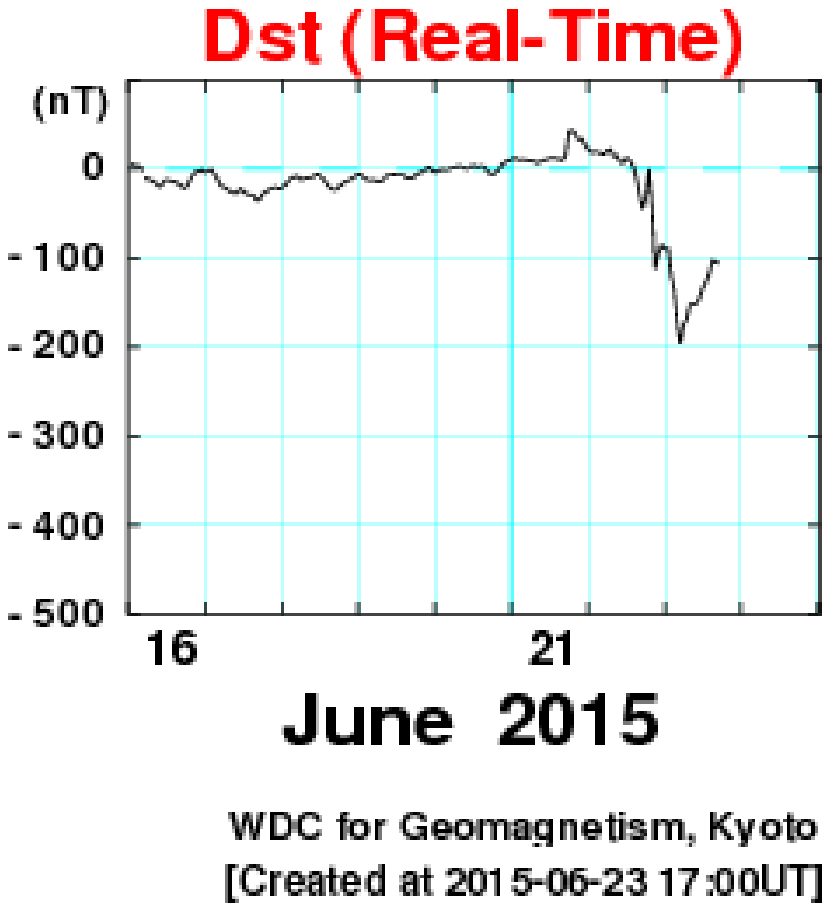
Together, the CME and shock provoked a intense geomagnetic storm which reached a minimum value of DST index of -195 nT. This index indicates the perturbation degree Of Earth's magnetic field. The figure shows the DST index during this epoc.

This geomagnetic storm began by June 22th And reached its peak by Junio 23th at 08:00 UT. After this, the storm entered into the recobering phase.

This storm reached the value of intense Because the shocked solar wind, as well as the CME material had magnetic fields with Important Bz component (read line in previous slide's figure). This condition favours geomagnetic disturbances.



créditos: http://wdc.kugi.kyoto-u.ac.jp/dst_realtime/

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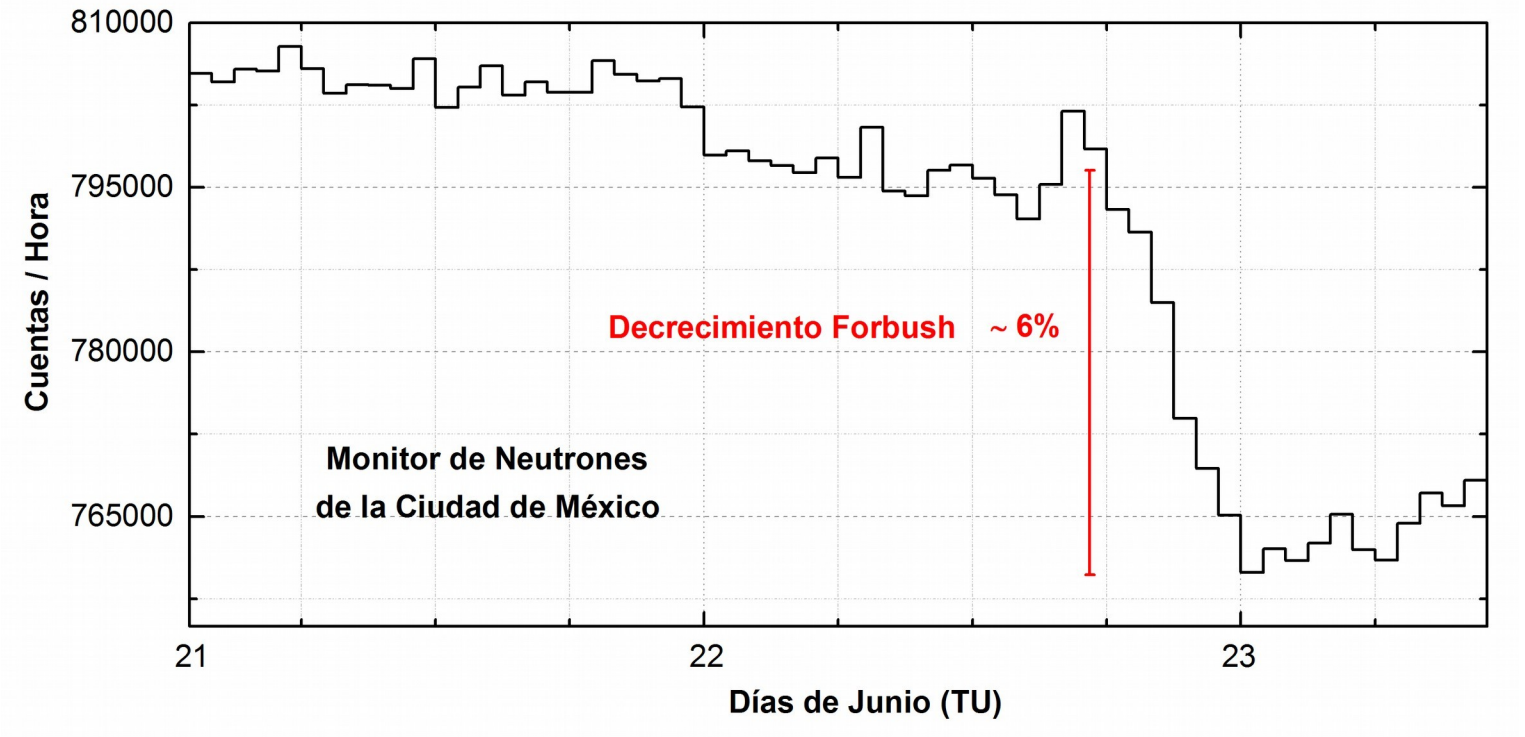

Additionally, our cosmic ray detectors registered the CME transit through out the Earht's envirpment. This can be appreciated in the Forbush decay about of 6% in the total of cosmic rays measured in Mexico City.

The figure shows the Mexico City neutron's monitor data during the epoc..