Space Weather Service Mexico
Special Report

SCiESMEX

Servicio de Clima Espacial - MX

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Special Report:
21th June 2015 event

Abstract:

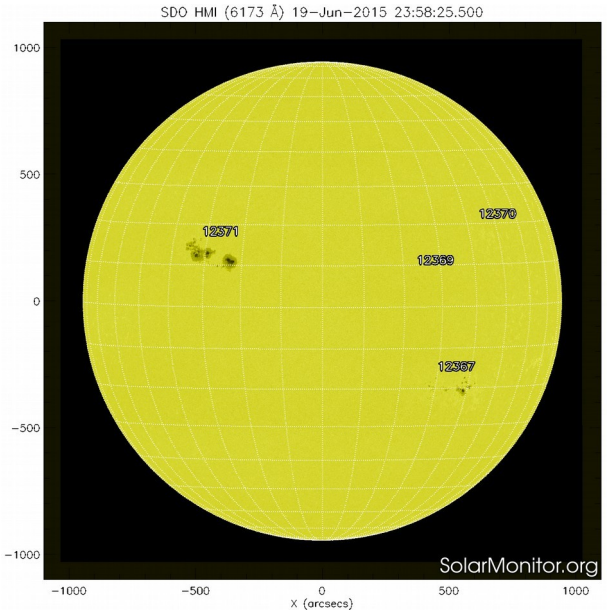
At 01:02 UT of June 21th it was detected a solar flare class M2.0 in AR12371. The AR was almost located in the Sun-Earth line (N12E16). Subsequently, It was confirmed the detection of a CME associated with the solar flare. The location of the AR suggests that the CME trajectory will hit the Earth. The reported initial speed of the CME is 1225 km/s; such a value implies that It is highly possible the pressence of a interplanetary shock in front of the CME.

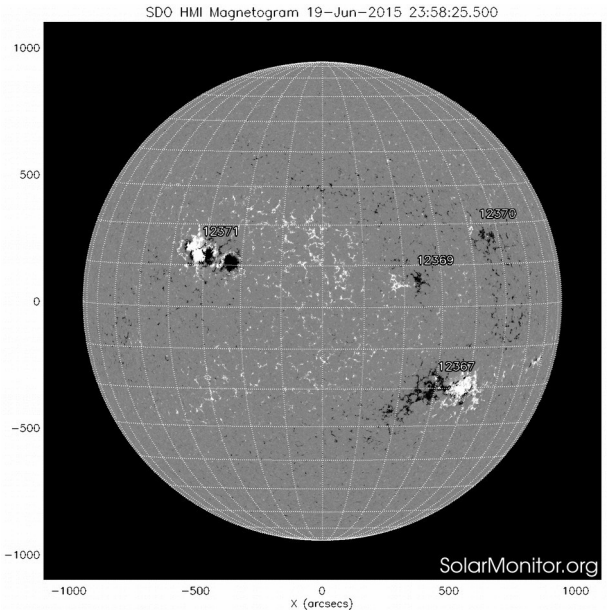
We expect the CME arrival to Earth's neighborhood the 2015/06/22 at 12:00 TU. It is possible that the CME/shock arrival provokes geomagnetic storms. There is also possible the presence of ionospheric perturbations during the 2015/06/23.

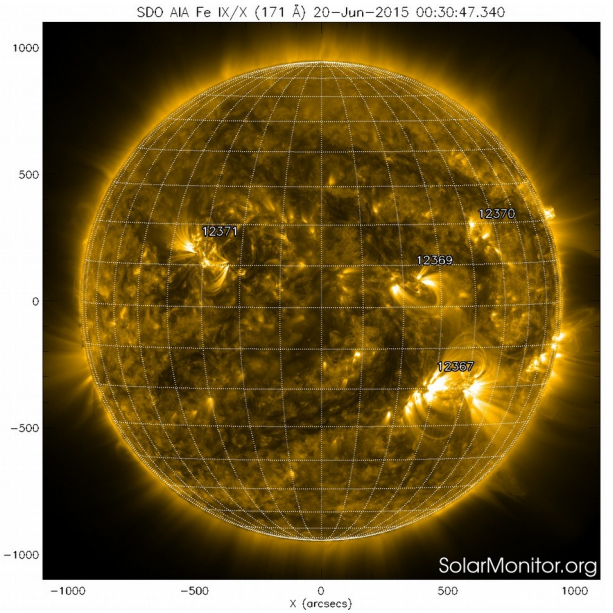
Special Report:
21th June 2015 event

Active Region (AR) 12371 (N12E16):

credits: http://solarmonitor.org



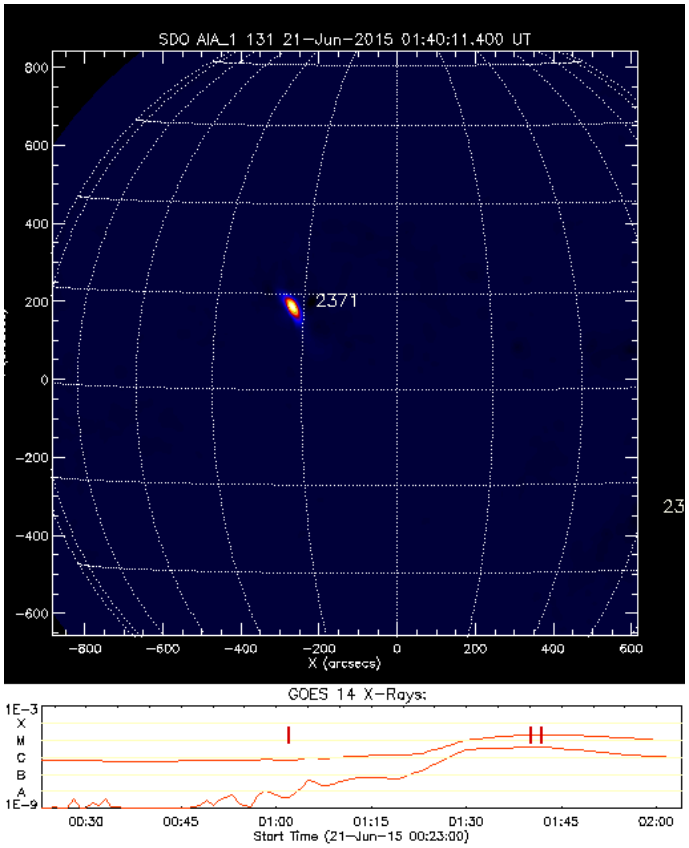




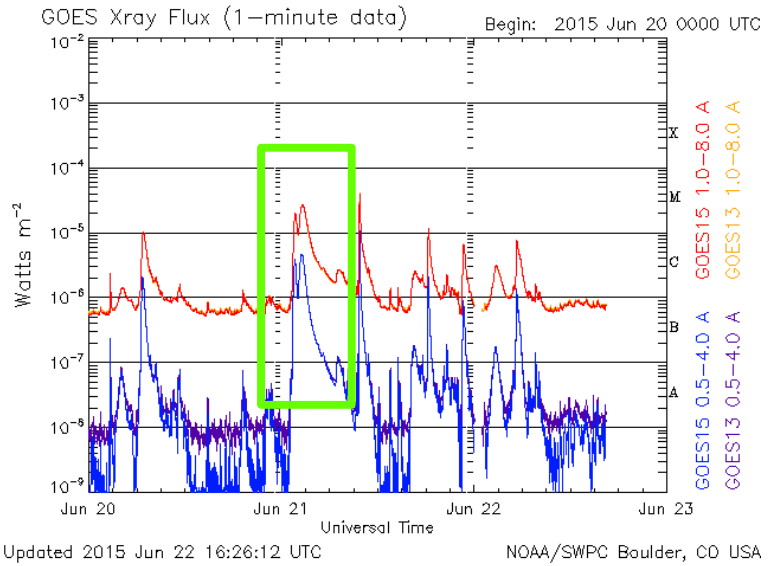
We present three images from left to right: (1) Photospher, we can appreciate the sun-spots grupo Asociated with the AR. (2) Magnetogram, which allows to appreciate the magnetic structures on the solar surface. The white(black) regions mark out the norht(suth) poles, respectively. (3) Solar Corona, the bright regions point out the active regions. We can appreciate in those regions the geometry of magnetic fields in the solar atmosphere.

Active Region 12371 is near the solar-disk center, at the left-upper side.

Special Report:
21th June 2015 event



créditos: http://solarmonitor.org

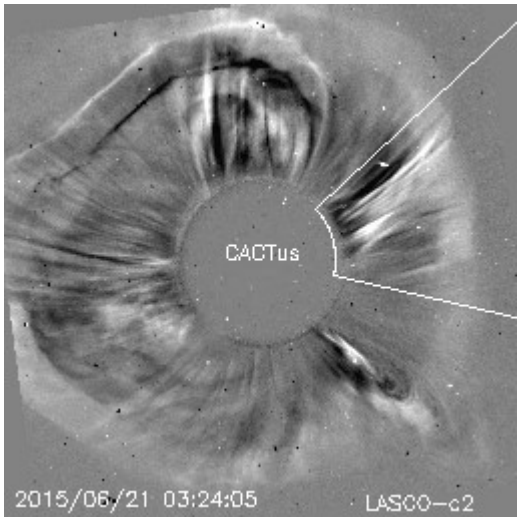


The Active Region had a solar flare M2.0 at 01:02TU, that lasted until 01:42TU. The solar flare was detected by GOES spaceships.

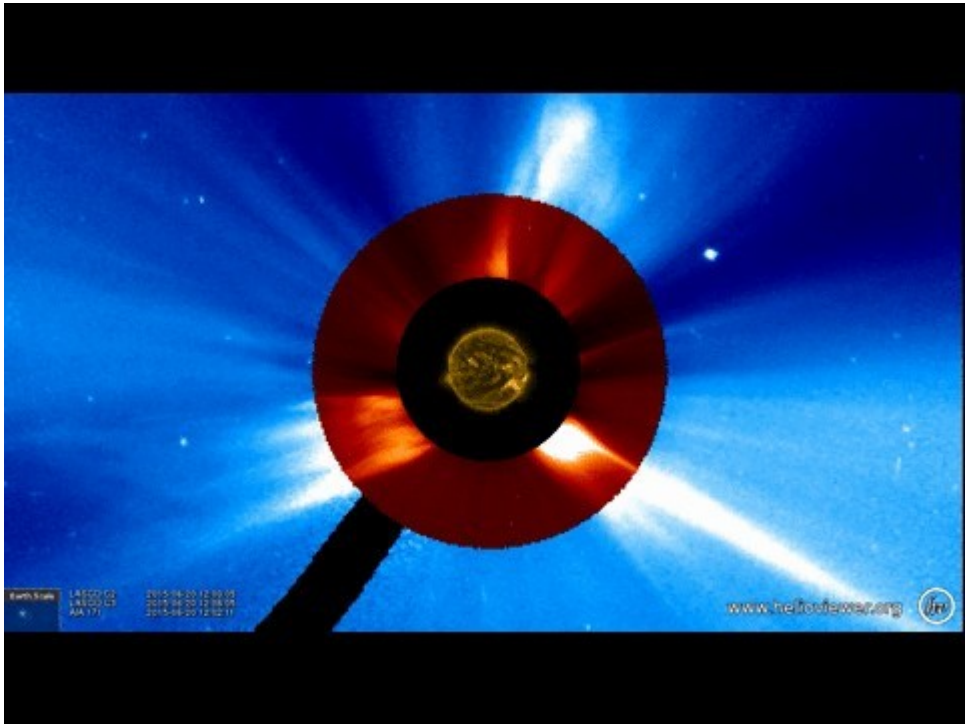
Left figure shows the location of the solar flare on the solar disk. Right image plots the X-ray fluxes detected by GOES. The green rectangle enclosed the solar flare.

Special Report:
21th June 2015 event

Eyección de masa Coronal:



créditos: http://www.sidc.oma.be/cactus/



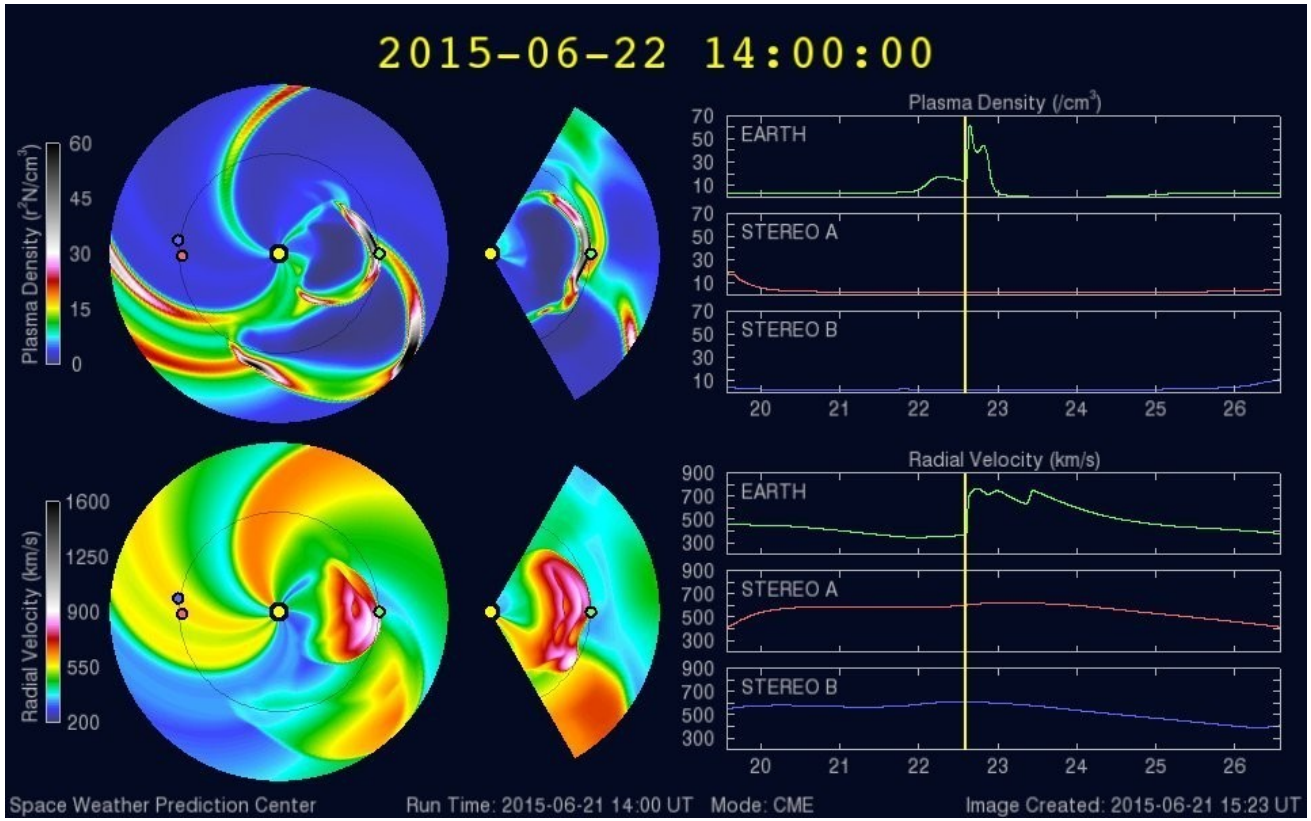
créditos: http://helioviewer.org

The automatic sytsem CACTus detected (2015/06/21 02:48TU) a CME associated with the solar flare. The CME is reported as halo directed to Earth, with an initial apparent speed of 1225 km/s.

Left panel shows the event's detection by CACTus. Right panel shows a composite image of the solar Corona before the event made with three different instruments.

Special Report:
21th June 2015 event

Eyección de masa Coronal: Arribo al ambiente terrestre



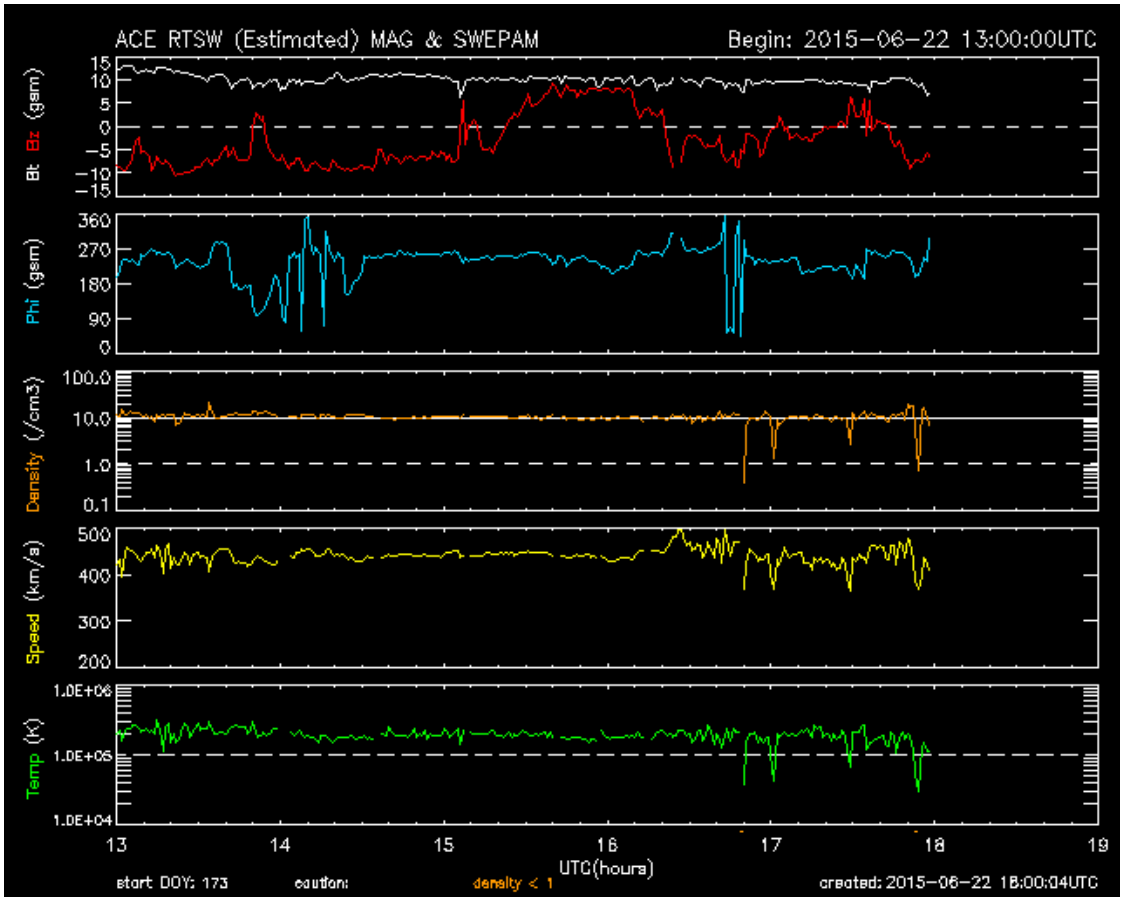
créditos: http://www.swpc.noaa.gov/

According with WSA/ENLIL code by SWPC-NOAA, the CME is expected to arrive to Earth's with a leading shock wave. According the simulations, the event will hit the Earth Approximately in June 22th At 14:00 UT (11:00AM central time of Mexico)

The figure shows the results from the simulations performed by the SWPC. The vertical yellow line marks out the arrival of the event to Earth's orbit.

Special Report:
21th June 2015 event

Eyección de masa Coronal: Arribo al ambiente terrestre



créditos: http://www.swpc.noaa.gov/

According in-situ measurements of solar Wind, at the Earth's orbit by ACE spaceship, the event did not arrive as simulations forecasted.

The figure shows some properties of solar wind near Earth's orbit. In those registers we cannot observe the arrival of The shock, neither the CME's one; at least as late as 18:00 UT.

Despite the event did not arrive as expected, The CME and shock will arrive in the forth-comming hours to the Earth's neighborhood. Additionally, it is well known that this kind of Events represent a serious hazard to geomagnetic stability.

Special Report:
21th June 2015 event

Coronal mass ejection:

SCiESMEX forecasting

Our analysis indicates that the coronal mass ejection **would be arriving to Earth's neighborhood in 2015/06/22 at 21:00 UT (16:00 central time of México)**.

The **arrival speed of CME would be 765+/-142 km/s** and its travel time (Sun-Earth) would be 44.34+/-7 hours.