MEGA X CLASS FLARE (X.28) del 4 Novembre 2003

Comment from the SIDC (RWC-Belgium): A new extreme flare (X.28) was again produced by active region Catania#70 (NOAA 0486) yesterday Nov.4 at 19:53UT. Despite its limb location, this event spawned a halo CME, with an initial speed estimated at 2380km/s. Model calculations indicate that the Eastern flank of this disturbance will produce glancing blow to the Earth magnetosphere on Nov. 6. This flare also produced a slowly rising proton event. The GOES proton flux is still rising now: the

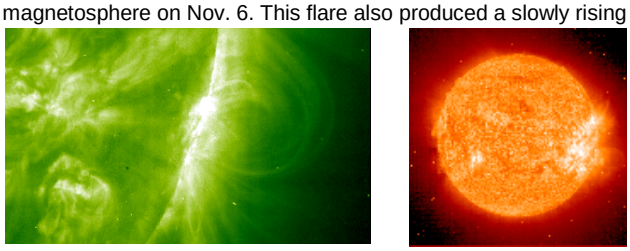

Fig.1 Immagine del Flare X.28 del 04/11/2003

>10MeV protons reached a maximum of 300 pfu at about 07:00UT and the flux is now decreasing. Geomagnetic conditions are currently quiet to unsettled , as the solar wind speed has now decreased to 500km/s with a stable positive Bz. Therefore, no activity is expected until the arrival of the CME, which can trigger a new major geomagnetic storm on day2. Late on day 3, active conditions are expected as the Earth enters a high-speed solar wind stream from a low latitude coronal hole. Solar activity is expected to drop in the comings days as the large active regions responsible for the repeating X-class flares are rotating behind the West limb. A few M-class flares could still be recorded on day 1.

A HISTORIC MOMENT IN CYCLE 23 - AN X28 FLARE ON 4 NOVEMBER 2003

UPDATE (by NW7US, Tomas Hood) on the X-Class Flare - 5 November 2003 - 2000 UTC

I have just finished a talk with Christopher Balch from the Space Environment Center, NOAA, regarding the super flare from 1955Z, 4-XI-2003. This flare saturated the instruments on the observing satellites for about 13 minutes, during the peak of the flare. This has made an accurate measurement of the flare's intensity difficult. The instruments stopped at X17.4.
The scientists and engineers who designed the original sensor equipment back in the 1970's had events that caused saturations at much lower levels. They redesigned things to handle X17-class events, thinking that it would be enough. This time, it was not.
Since we do not have any accurate record of flare intensity prior to the 1970's, our perspective of this latest series of flares is somewhat limited. Certainly, X-class flares of this magnitude are not regular events. But, they certainly are not unheard of. To pull out a rough estimate, but with very little confidence on this number, on how often we might see such activity, we think this is something we could see every 20 to 40 years.
Currently, as I write this, the Space Environment Center, who is the official "last word" on what a flare's classification becomes, is finalizing their analysis on this super flare. Chris has obtained two likely candidates: Using a standard log-normal fit analysis, the flare was X25. Using a result from an individual from the University of Colorado, Boulder, who analyzed HESSI data on the event (http://hessi.ssl.berkeley.edu/), the flare was an X28. The SEC has a procedure that Chris is finalizing, and validating. He will announce the final reading later today. Most likely, this flare will be somewhere between the X25 and X30 levels.
Certainly, the geomagnetic storming of the last few weeks is one of the highest in many years. It is officially number six on the scale of intensity in the last 30 years. The two major sunspot groups, the number of flares, and the CME activity makes this period the most active and intense of this solar cycle. We have witnessed a truely spectacular historical moment.
What's coming down the line? I usually base my forecasts on a 27-day solar rotation period. What happens today in terms of geomagnetic activity is possibly what will occur 27 days from now. Of course, sunspot and coronoal hole activity might decline duing that rotation period. The outlook is that in about 5 to 10 days, a sunspot group that had a lot of activity is going to rotate back around and start to influence space weather. But the big question is: Will these huge sunspot groups that just left us retain enough energy to last the 27-day rotation, to deliver another period of extreme solar weather?
NASA is planning to launch in November 2005 the "Stereo Mission" (http://stereo.jhuapl.edu/mission/overview/overview.html), which will place an observing space craft leading the Earth's orbit, and another space craft trailing the Earth, such that they will be able to see around the sun at what is coming and what has went. This certainly will become a major tool in our forecasting of space weather, and propagation.
4 November 2003 - 2200 UTC
At 1955Z, 4-XI-2003, an X-class flare peaked from region 486. Initial data from GEOS 12 indicates that the flare is an X18, while GEOS 10 shows it as X17. However, there is speculation by SOHO that it might be much stronger

(greater than X20), as this event saturated the sensor for 11 minutes. I have viewed preliminary images of this very bright and significant flare, and it is truly amazing.
If the flare is larger than the X17 flare from recent activity, this will become one of the two most powerful flares recorded. At this moment, though, the official word is that this flare is an X17.4 event. If, indeed, it is greater than X20, it will be a moment of history!
The flare has caused extensive radio blackout conditions on most of the HF radio spectrum. Ground wave communications is not significantly impacted, nor is line-of-sight VHF and above.
A type II Radio Emission began at 1942Z 4-XI-2003 with an estimated velocity of 1268 km/s. Interplanetary type II bursts are statistically strongly associated with fast CME and interplanetary shock waves (Cane, Shelley & Howard 1987). Thus, there is a chance that we will have at least a glancing blow from the side of the possible CME associated with this new flare. I will update when more data is known.