

**RESEARCH****THE HIDDEN SIDE OF THE SUN**

Fermi, the NASA satellite that studies gamma photons in space, in which Italy is participating with INFN, the National Institute for Astrophysics (INAF) and the Italian Space Agency (ASI), has detected new ultra-high energy solar flares, that originated in the non-visible side of the Sun. Although the light that comes from these violent eruptions is emitted on the side of our star hidden to us, and cannot therefore reach us directly, scientists at the Fermi collaboration have managed to observe it. The ions produced and accelerated in the flares, in fact, being electrically charged, travel along the sun's magnetic field lines, which connect the place where the flare took place also with parts distant from the Sun. After a journey of more than 500 thousand km, these ions interact in the denser areas of the surface of the Sun, on the side visible to us, producing pions which, in turn, decay into gamma rays, ultra-high energy photons that were detected by Fermi thanks to the LAT (Large Area Telescope) instrument placed on board the satellite. Their observation therefore represents a unique opportunity to study how the ions are accelerated during solar flares on the hidden side of the Sun (so-called behind-the-limb or BTL flares). Thanks to Fermi-LAT, it was possible to double the number of observations of these rare phenomena: since the '80s up to the launch of Fermi in 2008, only three BTL had been detected but all with energies below 100 MeV. While in the first eight years in orbit, Fermi detected three more with emissions up to the GeV range. The results of the three BTL seen with Fermi-LAT were presented on 30 January during the conference of the American Physical Society (APS) in Washington D.C., and published in *The Astrophysical Journal*. ■