

JANUARY 2021



RESEARCH

THE FIRST CATALOGUE OF SOLAR FLARES OBSERVED IN THE GAMMA FREQUENCY

A first, detailed, and extensive catalogue of solar flares - violent explosions of electromagnetic radiation that take place in the sun's corona - has been presented in the journal Astrophysical Journal

Letter Supplement (APJS). These solar flares were observed in the period from 2010 to 2018 in the gamma frequency by the Large Area Telescope (LAT), one of the two detectors installed onboard NASA's Fermi Gamma-ray Space Telescope. Italy participates in the international collaboration that is in charge of Fermi-LAT through contributions provided by INFN, the National Institute for Astrophysics (INAF) and the Italian Space Agency (ASI).

Fermi-LAT's great sensitivity has made it possible to observe some 45 solar flares that occurred in the period of maximum activity during the last solar cycle. This catalogue has increased the number of events known up to today by 10 times, making it possible to identify various, high-energy, solar photon emission mechanisms. In addition to the Sun's emission of gamma-ray bursts that last a few minutes, coinciding with flares detected in X-rays by other satellites, the space telescope registered events of a surprising extension and duration - up to 20 hours - that do not seem to have a counterpart in other wavelengths. The Fermi-LAT measurements have provided evidence that seems to confirm the hypothesis according to which extended emissions of the second type are generated by coronal mass ejections. ■