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# High-energy emission from a magnetar giant flare in the Sculptor galaxy

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Magnetars are neutron stars with the strongest magnetic fields known in the Universe, with an intensity up to a thousand times higher than typical neutron stars. Rarely, magnetars can produce enormous eruptions, called Magnetar Giant Flares (MGF), consisting of short-duration bursts of hard X-rays and soft gamma rays. On April 15, 2020, a short bright burst of MeV gamma rays triggered the Gamma-Ray Burst Monitor (GBM) aboard the Fermi spacecraft, called GRB 200415A and localized by the InterPlanetary Network (IPN) inside the disk of the nearby Sculptor galaxy. Starting 19 seconds later, and for nearly 300 seconds, the Large Area Telescope (LAT) detected GeV photons in spatial coincidence with the signal at lower energies. In this talk we present the recently published results of the GBM and LAT analysis on GRB 200415A. Detailed analyses show that the sub-MeV emission has peculiar properties typically observed in flares from nearby magnetars. The GeV detection, consistent with the IPN localization and spatially associated with the Sculptor galaxy, represents the first detection of the high-energy emission from a MGF and likely arises from an energetic, ultra-relativistic MGF outflow, as it collides with an external bow-shock shell. This discovery demonstrates that these events could constitute their own class of GRBs and motivated us to perform a combined GBM-LAT search over 14 years of Fermi data to discover additional yet unidentified MGFs.

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