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Optical, X, HE gamma-ray flare of the FSRQ S4 1030+61

ATel #9009; **Luigi Pacciani (IAPS-INAF)**
on **29 Apr 2016; 08:20 UT**

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Subjects: Optical, Ultra-Violet, X-ray, Gamma Ray, >GeV, Blazar

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The Large Area Telescope (LAT), one of the two instruments on the Fermi Gamma-ray Space Telescope, has observed unusually high activity above 10 GeV from

a source positionally consistent with the flat spectrum radio quasar S4 1030+61 ($z=1.40$).

The HE trigger detected activity at $E > 20/(1+z)$ GeV with TS ~ 78 integrating the FERMI-LAT data between 2016-03-27 and 2016-04-28,

following the prescription of Pacciani et al. 2014, ApJ, 790, 45.

The source showed a flux of $(25.5 \pm 1.4) \times 10^{-8}$ ph/cm²/s ($E > 100$ MeV), and a photon index of 2.10 ± 0.07 , to be compared to a catalog flux of 6.1×10^{-8} ph/cm²/s ($E > 100$ MeV),

and a catalog photon index of 2.20.

The three most energetic photons detected from a position positionally consistent with the source have an energy of 26, 23, and 20 GeV.

The Swift follow-up revealed the source in its brightest state in optical-uv too:

The preliminary Swift-UVOT photometry on 2016-04-19 is:

V = 15.56 +/- 0.05

B = 15.93 +/- 0.02

U = 15.07 +/- 0.02

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UVW1 = 15.32 +/- 0.02

UVM2 = 15.32 +/- 0.01

UVW2 = 15.71 +/- 0.02

Magnitudes are in the UVOT photometric system (Poole et al. 2008, MNRAS, 383, 627) and have not been corrected for Galactic extinction.

The optical/uv flux level are 0.3-0.5 magnitude brighter than the Swift-UVOT ever detected brightest state (observed during the follow-up of a bright gamma-ray flare

with a flux of $1.5 \pm 0.3 \text{ E-6 ph/cm}^2/\text{s}$, $E > 100 \text{ MeV}$, performed on May 2010, see ATel #2622, and ATel #2628).

The simultaneous Swift-XRT observation gives a counting rate of $0.078 \pm 0.005 \text{ cps}$, a soft X-ray spectrum with photon index 2.2 ± 0.2 (90% c.l.),

an unabsorbed flux of $(2.85 \pm 0.40) 10^{-12} \text{ erg/cm}^2/\text{s}$ (0-3-10 keV).

The x-ray flux is at the same level detected during the May 2010 outburst.

Similar optical-uv, and X-ray fluxes were obtained for a previous HE flare, simultaneous to the observation of a giant NIR flare

reported in ATel #8715 on February 16th, 2016.

We encourage further multi-wavelength observations, particularly in NIR.

We thank the Swift team and Swift Observatory Duty Scientist for rapidly scheduling the observation.

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