FERMI transient J1544-0649

a flaring radio-weak BL Lac

Bruni et al. 2018, ApJL, 854, L23

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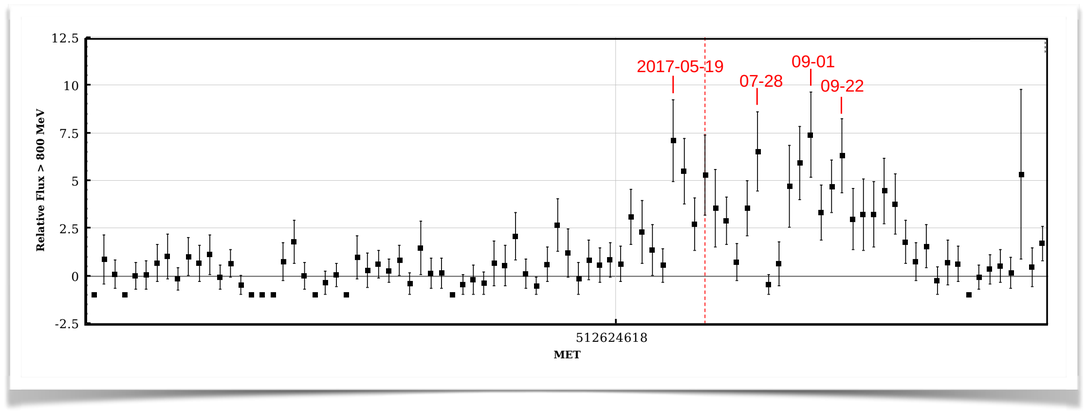
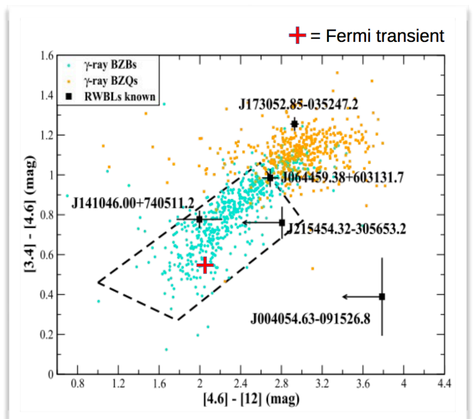
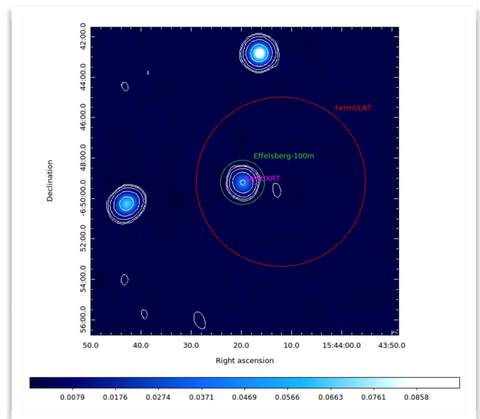
The discovery

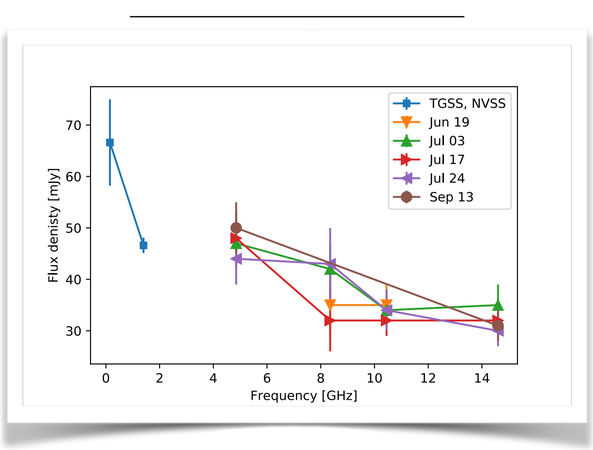
- Outburst from a newly-found source was detected by Fermi/LAT on May 15, 2017, visible for 2 consecutive weeks (Ciprini et al. 2017, ATel #10482)
- X-ray counterpart detected by Swift/XRT, still active after 12 months
- Optical transient detected as well, host galaxy at z=0.171
- Position coincident with faint NVSS and TGSS object (1.4 GHz, 150 MHz)
- The Rx ratio falls between the RL and RQ population, confirming a faint radio emission

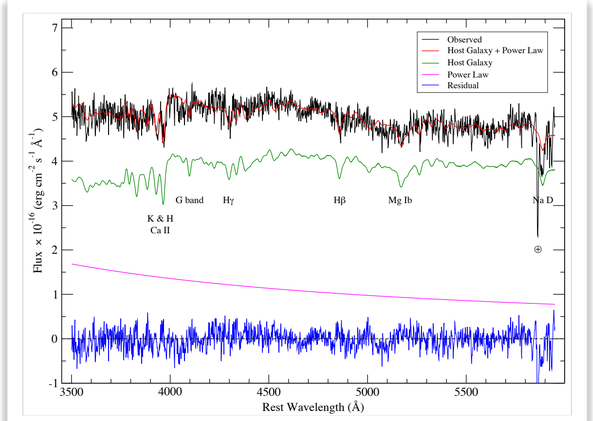




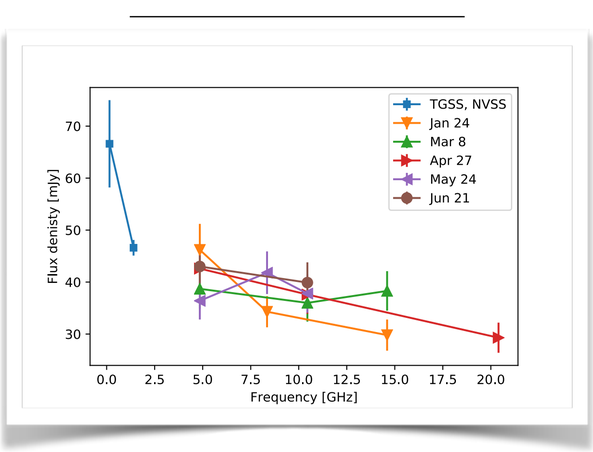


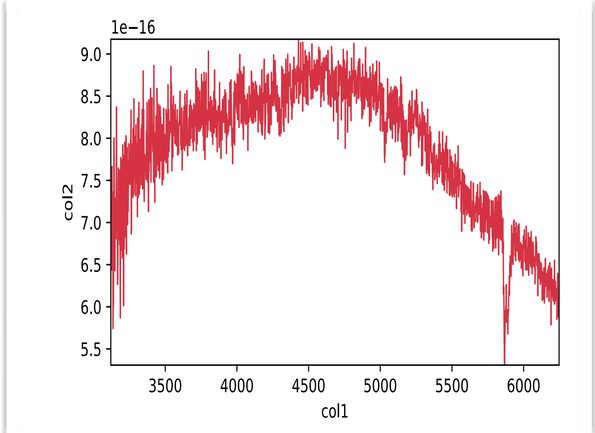
2017





2018





- Latest spectrum from OAGH (Cananea, Mexico) confirms featureless spectrum, flux increased by 50% w.r.t. August 2017
- SED model by Ghisellini & Tavecchio 2009: two-humps SED typical of Blazars, peaks position typical of low-power BL Lac. Fitting parameters typical for low-power BL Lac (like Mkn 501), small viewing angle

Monitoring campaign

- Monitoring with Effelsberg single dish started on June 19, 2017, still ongoing. Flat spectral index suggests jet orientation towards observer. Hints of variability only at frequencies higher than 10 GHz (closer to core region)
- Optical observations with San Pedro Martir 2.1m telescope, in August 2017, showed featureless spectrum, suggesting BL Lac classification
- BH mass from velocity dispersion: 3.4e8 Msun
- These properties point towards a new example of radio-weak BL Lac, showing for the first time a flare in the gamma/X-ray band.

Multi-epoch SED: blue points are pre-burst, red points post-burst. Pre-burst from ASDC database + upper limit from INTEGRAL/ISGRI first 1000 orbits. Red line is BL Lac host galaxy template, dashed line is AD+Torus+Corona emission

Conclusions

- First high-energy flare from a radio-weak BL Lac
- Flare not (yet?) detected at radio frequencies
- Inefficient jet collimation? Distance between gamma-ray emission region and mm-core larger than normal?
- Keep the monitoring on….

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