

Absorbed jets in gamma-ray narrow-line Seyfert 1 Galaxies: the case of SDSS J164100.10+345452.7

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In the last 15 years narrow-line Seyfert 1 galaxies (NLS1) have been investigated mainly in the radio, optical, UV and X-ray energy bands. In 2008, the detection of PMN J0948+0022 by Fermi-LAT allowed us to extend their spectral energy distribution to the gamma-ray energy band, paving the way to include gamma-ray NLS1 galaxies into the class of extra-galactic jetted sources. Indeed, their properties place them at the low-power end of the flat-spectrum radio quasar luminosity function, displaying low black-hole masses, accretion rates close to the Eddington limit, and low jet powers. Despite being considered radio silent, gamma-ray NLS1s may present short and intense radio flares. We carried out an intensive multi-wavelength monitoring of SDSS J164100.10+345452.7 by means of the Metsähovi radio (37GHz) and Swift (Optical, UV, X-ray) observatories over a 2-year baseline with a weekly pace. Our campaign allowed us to obtain Swift data almost simultaneous with a radio flare. Detailed pre-, post-, and flare X-ray spectroscopy allowed us to discover a remarkable difference in the source spectrum in the distinct epochs, which permitted to establish the origin of the 37 GHz radio flare as the emergence of a jet from an obscuring neutral absorber detected in the X-ray observations. This result is the first detection of an absorbed jet in a gamma-ray narrow-line Seyfert 1 galaxy.

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