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First detection of VHE gamma-ray signal from the FSRQ TON 0599

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TON 0599 (z=0.7247) is the latest addition to a limited club of flat spectrum radio quasars (FSRQs) detected in very high energy (VHE, E > 100 GeV) gamma rays. Its redshift makes it the third farthest source, filling the gap in the redshift distribution of the VHE gamma ray emitters. It was detected for the first time with the MAGIC telescopes on 2017/12/15. The observations were triggered by hardening of the high energy (HE, E > 100 MeV) gamma-ray spectrum observed with Fermi-LAT. During 1 hour of observation with the MAGIC telescopes the flux reached about 40 per cent of the Crab Nebula flux above 80 GeV. The observations continued until 2017/12/29, witnessing gradual decrease of the flux. The spectrum in VHE gamma rays connects smoothly to the spectrum in HE obtained from simultaneous observations with Fermi-LAT. The joint spectrum shows sudden drop above about 8 GeV, which may suggest a strong absorption of VHE gamma rays within the source. In addition, we were able to follow the spectral evolution during the fading phase of the flare. We round the multiwavelength picture with observations in optical, IR, and radio bands acquired by the WEBT collaboration during the whole 2017-2018 optical observing season, from November to May.

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