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An unprecedentedly hard spectrum in VHE for the Extreme HBL 1ES 2344+51.4

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The BL Lac object 1ES 2344+51.4 was one of the first sources to be included in the EHBL (Extreme High-peaked BL Lac) family: its broadband Spectral Energy Distribution (SED) features the synchrotron peak in the hard X-ray band, and from previous studies of the object in the VHE (Very-high-energy, $E > 100\text{GeV}$) gamma-ray range, its Inverse Compton (IC) peak is expected at $\sim 200\text{GeV}$.

1ES 2344+51.4 has been object of several campaigns in the past due to its peculiar variability in the X-ray and VHE bands. In 2000, observations with Beppo-SAX revealed a large 0.1-10 keV flux variability on the timescales of a few hours, in particular during a strong flare. It was suggested that one electron population is responsible for the steady low energy synchrotron emission and another electron component producing higher energy X-rays with high time variability. The latter component should be responsible for the VHE emission via IC scattering.

We present the most recent multi-wavelength study of the EHBL 1ES 2344+51.4, detected in an enhanced state in VHE band by the MAGIC and FACT telescopes in August 2016: high sensitivity observations were triggered by the monitoring carried out with FACT at TeV energies.

The analysis of MAGIC, FACT and Fermi spectra constrains the IC peak of the SED, revealing an unprecedentedly hard spectrum in the HE and VHE bands and allowing us to study its variability at the highest energies. These data, together with simultaneous multifrequency data, (Swift-XRT, OVRO, KVA), will be used to model the emission of this peculiar EHBL during this particularly high state.

Are you presenting on behalf of collaborations or institutions?

My affiliation is University of Rijeka and I am willing to present on behalf of the MAGIC and FACT Collaborations

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