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Broadband characterisation and physical implications from the most extreme X-ray flaring activity of the high-peaked BL Lac Mrk 501

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The high-frequency-peaked BL Lac object Markarian 501 is a very high energy (VHE, E>100 GeV) emitter located in our extragalactic neighborhood (z=0.034). The source can be detected in the VHE band during low state, what makes this target an ideal source for long-term multi-wavelength studies covering the entire electromagnetic spectrum. During a multi-wavelength campaign in 2014, the source showed the highest X-ray activity observed by Swift-XRT during the last decade. The source displayed very hard spectra at X-rays and gamma-ray energies with variability on day timescales. The distortion of the broadband SED strongly suggests the existence of, at the very least, an extra component with ultra-energetic and relatively narrow electron energy distribution, which had never been seen before for Mrk501. In the conference I will report about this unprecedented flaring event and its physical implications.

Author: BECERRA GONZALEZ, Josefa (NASA GSFC)

Co-authors: PANEQUE CAMARERO, David (Instituto de Fisica de Altas Energias (IFAE)); TAVECCHIO, Fabrizio (INAF); ISHIO, Kazuma (MPI); NODA, Koji (Max-Planck-Institute for Physics); PERRI, Matteo (ASI Science Data Center)

Presenter: BECERRA GONZALEZ, Josefa (NASA GSFC)

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