

ASTROPHYSICS SEMINAR

Tuesday, 16 September 2008 at 11:00

PKS 2155-304: long term H.E.S.S. observations and spectacular outbursts results

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Abstract. The spectacular increase of the sensitivity of Cherenkov telescopes allowed the detection of 22 blazars emitting very high energy (VHE) gamma-rays. The discovery of very distant blazars has important implications on the understanding of the acceleration processes in blazars and on the indirect measurement of the extragalactic background light. Unfortunately, most of the discovered blazars are weak TeV sources (typical emission around a few percent of that of the Crab nebula), but some of them sometimes exhibit spectacular flares. The High Energy Stereoscopic System (H.E.S.S.) has contributed with its sensitivity to the detection of distant blazars in the TeV range. With monitoring campaigns, H.E.S.S. has also searched for flux and spectral variability in blazars on timescales ranging from months down to minutes. Since 2003, H.E.S.S. has monitored PKS 2155-304 (one of the brightest and best-studied VHE gamma-ray sources) and in July 2006 has detected this source in an active state, followed by the detection of two extraordinary flares on July, 28th and 30th, with a temporal resolution of the order of the minute. Results from this H.E.S.S. campaign will be presented here with particular emphasis on the evidence for a quiescent state in this source and on the spectral and flux variability. The unprecedented statistics collected during the flaring period (July 28-31, 2006) allowed a temporal variability study that will be presented here, indicating for the first time in this energy domain that the strong variability can be accounted for as a realization of a random stationary Gaussian process with the logarithm of the fluxes being the relevant Gaussian variable. Finally, an X-ray observation of PKS 2155-304 with the Chandra satellite taken during the second flare, will be presented.

Additional Information

The seminars are given in the ISDC "Pavillon" building
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