Long-term Optical and NIR photometry of the BL Lac Object PKS 2155-304

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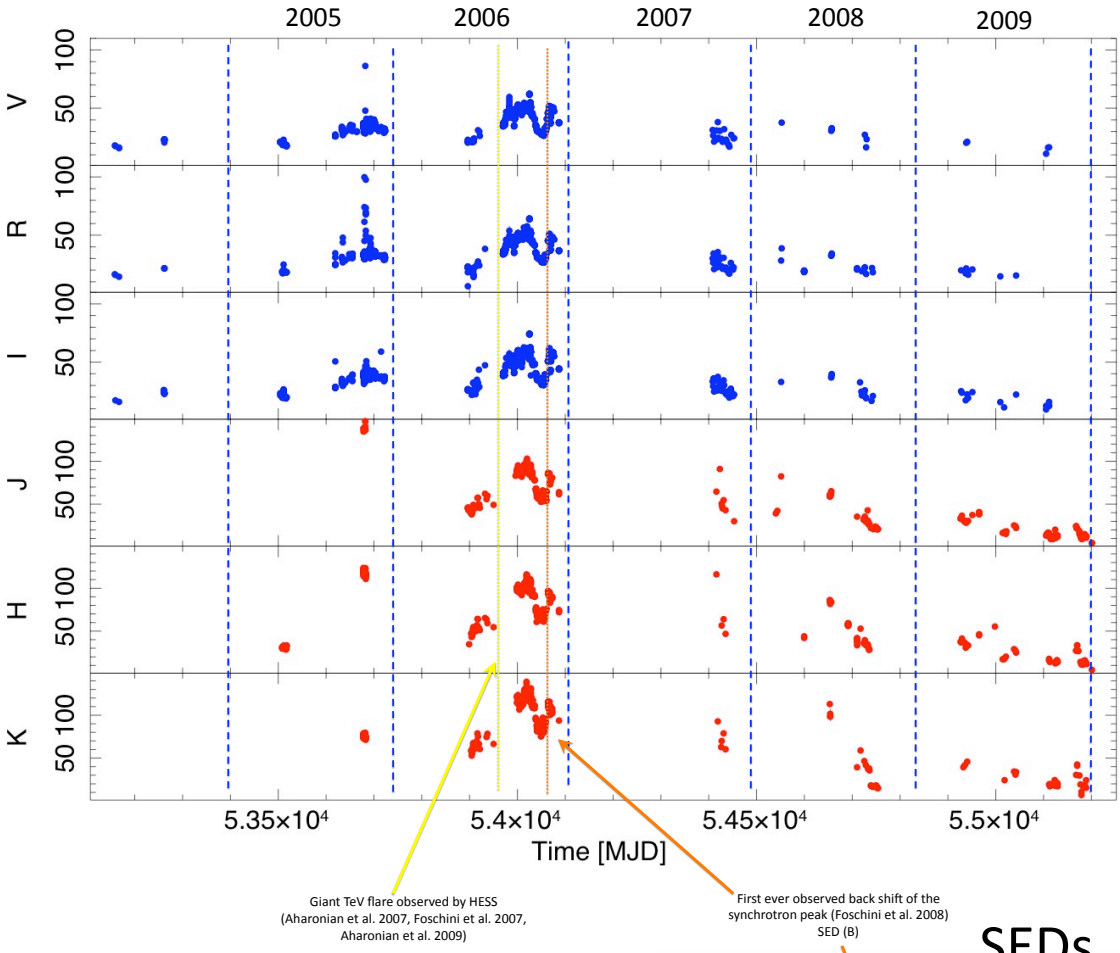
We present photometric analysis in the VRIJHK bands of the blazar PKS 2155-304 (z=0.116) obtained with the REM robotic telescope (La Silla Chile) in 2005-2010. This study is unprecedented in terms of number of photometric points and spectral coverage. Preliminary results can be found in Dolcini et al. (2007) and Impiombato et al. (2008).

Data analysis has been carried out following standard recipes. Instrumental magnitudes were obtained via aperture photometry by means of an automatic pipeline, which aligns and rotates frames to a common reference, derives and calibrates photometry comparing to standard stars in the field. Results were controlled manually and the agreement is typically better than 10% in flux. The quoted errors are at 1 sigma and they include photometric and calibration uncertainties.

REM (Rapid Eye Mount) is a 60 cm fully robotic telescope located at the ESO Cerro La Silla observatory (Chile). The telescope has a Ritchey-Chretien configuration with a 60 cm f/2.2 primary and an overall f/8 focal ratio in a fast moving alt-azimuth mount providing two stable Nasmyth focal stations. At one of the two foci, the telescope simultaneously feeds, by means of a dichroic, two cameras: REMIR for the Near-InfraRed (NIR) and ROSS for the optical frequencies. Both the cameras have a field of view of 10 arcmin and imaging capabilities with the usual NIR (J, H, and K) and Johnson-Cousins VRI filters. More information about the REM project and capabilities can be found in Zerbi et al. (2001), Chincarini et al. (2003), Covino et al. (2004).



We performed a systematic search for short tem variability and found two interesting cases. We searched for characteristic time scale τ, as defined by the formula:

$$F(t) = F(t_0)\exp[\frac{-(t-t_0)}{\tau}]$$

MJD	Date	Filter	Flux [mJy]	τ [min]	Significance [σ]
55120.2594200	16 Oct 2009	J	12.9 ± 0.4		
55120.2705800		J	9.4 ± 0.3	51 ± 16	8.8
55189.0722900	24 Dec 2009	K	24 ± 1		
55189.0882900		K	15.4 ± 0.4	51 ± 12	8.9

SEDs