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Optical Monitoring of OT 546 in 2009

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Abstract. We reported the monitoring results of OT 546 in V, R and I bands, observed on 22 nights from February 16 to July 1 in 2009 at Weihai Observatory, Shandong university. During our monitoring, its variability amplitude was small and a possible microvariability was detected on one night using both C and F tests.

Key words. AGN: blazar—BL Lac: individual: OT 546.

1. Introduction

OT 546 (ZW I 187) was classified as a BL Lac object by Angel & Stockmann (1980). An optical variation of 2.1 mag was found in B band (Hall & Usher 1972), but its variability amplitude was small recently. The average brightness in V and B bands were around 16 mag (Kinman 1976) and 16.7 mag (Pica *et al.* 1988), respectively. Rapid short term variability was reported by Pica *et al.* (1988).

2. Observations and results

Optical observations were carried out at Weihai Observatory, Shandong University, using the 1.0-m telescope equipped with a back illuminated PIXIS 2048B CCD camera at the cassegrain focus. The field-of-view is about $12' \times 12'$. Standard Johnson Cousins filters were used in our observations. The data reduction was carried out following the standard procedures of IRAF packages. All images were processed by bias and flat-field correction. Then, aperture photometry was used to obtain the instrumental magnitude for both the target and the comparison stars. Comparison stars B, H and L taken from Fiorucci & Tosti (1996) were used, and the magnitude of the source was derived by differential photometry.

Light curves of the source in V, R and I bands were shown in Fig. 1. During our observations, the variability amplitude was small, similar to the recent observations (Fiorucci & Tosti 1996; Katajainen *et al.* 2000; Xie *et al.* 2004), and the brightness variation in the V band was between 15.72 mag (JD 2454978.142) and 16.05 mag (JD 2454907.304) with an average brightness of 15.92 mag. The observed largest intranight variability amplitudes in the V, R and I bands were $\Delta V \sim 0.259$ mag, $\Delta R \sim 0.310$ mag and $\Delta I \sim 0.237$ mag, respectively.

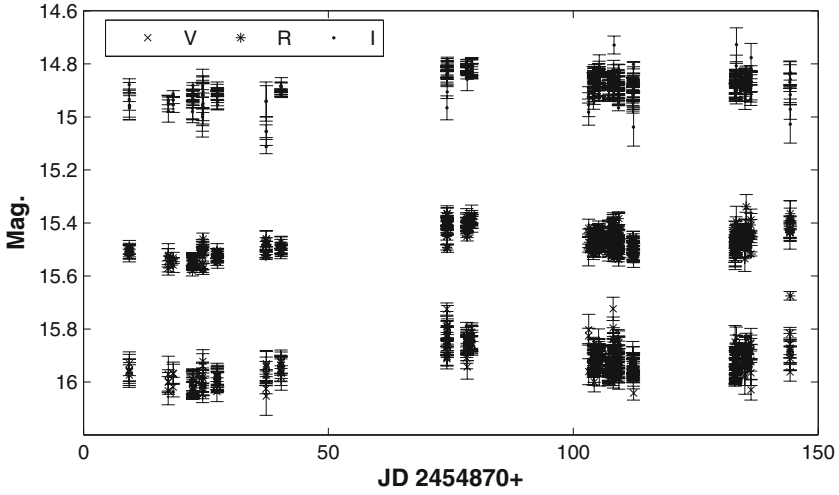

Figure 1. Light curves of OT 546 in the V, R and I bands.

In order to detect the microvariability, both C and F tests have been performed to 22 nights of light curves. Microvariability was found only on 1 out of 22 nights, and the C values (Jang & Miller 1997; de Diego 2010) in the V and R bands were 2.767 and 3.271, respectively, which are >2.576. At the same time, the results of the F-test (de Diego 2010; Gaur *et al.* 2012) in the V and R bands also exceeded the critical F value (1% significance level) on 2009 April 22. So the microvariability is reliable.

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