Data reduction and analysis of the multiband optical images of the blazar Mrk180

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(Received 9 May 2012; in final form 11 May 2012)

Abstract
Nearly simultaneous multiband monitoring of blazars is very limited and most studies reported in literature are conflicting, too. Although optical variability on intra-night timescales is now a well established phenomenon for blazars, its relationship to long-term variability remains unclear. Possible clues could come from monitoring the optical spectrum for correlation with brightness. The presence or absence of bluer color in blazar color index, when its luminosity is increased on intra-night and inter-night timescales, can provide interesting clues to the origin of blazar variability from hourly to much longer timescales. Luminosity of blazars varies at all wavelengths over a variety of timescales. Various models have been proposed to explain blazar variability. However, the mechanism responsible for variability is not conclusively understood. One factor which can discriminate the various variability models is that of color (spectral index) variations of blazars. This factor may help to better understand the mechanism of blazar variability. Therefore, it was initially proposed, by the second author of this paper to the OHP observatory, to carry out quasi-simultaneous multiband monitoring of one of the brightest blazer, Mrk180. Fortunately, it was accepted by the scientific team of the observatory and the 1.20m telescope time was allocated to the project from 23 to 28 April 2009. Because of the weather conditions, we could only monitor this blazar for three nights. Raw data processing and data reduction were performed using the standard system of Europe Southerner Observatory, ESO-MIDAS. We considered two reference stars and measured the magnitudes of the reference stars and the blazar Mrk 180 and then plotted the light curves and the color index diagrams. The light curves showed the optical variations of the blazar. The maximum amplitude value of its variations was 0.185 mag for the V filter. Investigating the blazar color index shows its variations on intra-night and inter-night timescales.

Keywords: active galactic nucleus, blazar, optical variations, light curves, color index.

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