Very high energy $\gamma$-ray and near infrared observations of 1ES2344+514 during 2004–05

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Abstract

We have observed the BL Lac object 1ES2344+514 ($z = 0.044$) in very high energy (VHE) gamma-ray and near-infrared wavelength bands with TACTIC and MIRO telescopes, respectively. The observations were made from 18th October to 9th December 2004 and 27th October 2005 to 1st January 2006. Detailed analysis of the TACTIC data indicates the absence of a statistically significant gamma-ray signal both in overall data and on a nightly basis from the source direction. We estimate an upper limit of $I(\geq 1.5 \text{ TeV}) \leq 3.84 \times 10^{-12}$ photons cm$^{-2}$ s$^{-1}$ at a 3$\sigma$ confidence level on the integrated $\gamma$-ray flux. In addition, we have also compared TACTIC TeV light curves with those of the RXTE ASM (2–12 keV) for the contemporary period and find that there are no statistically significant increases in the signal strengths from the source in both these energy regions. During 2004 IR observations, 1ES2344+514 shows low level (0.06 magnitude) day-to-day variation in both, J and H bands. However, during the 2005 observation epoch, the source brightens up by about 0.41 magnitude from its October 2005 level J magnitude = 12.64 to J = 12.23 on December 6, 2005. It then fades by about 0.2 magnitude during 6 to 10 December, 2005. The variation is seen in both, J and H, bands simultaneously. The light travel time arguments suggest that the emission region size is of the order of $10^{17}$ cm.