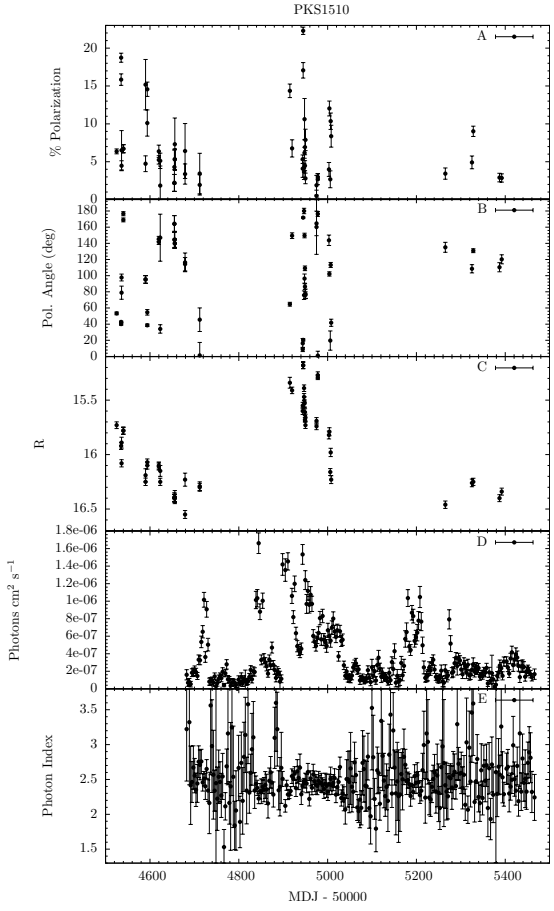

Fig. 1. Panel (A) shows the polarization percentage P(%), (B) the rotation of the optical polarization angle (PA), (C) the R-band variations obtained within our Polarimetric Monitoring project. Panels (D) and (E) shows γ-ray light-curves for the monitored period obtained with LAT.

from 2008 to 2010 and look for possible correlations with data obtained with the Large Area Telescope (LAT) onboard Fermi, obtained from August 2008 to September 2010. Some of our R-band photometric data on this source have been already published in D'Ammando et al. (2009, 2011) as part of the GASP-WEBT monitoring project (Villata 2010). However, our polarization data obtained from 2008–2010 are shown here for the first time.

2. RESULTS FOR PKS 1510−089

Our particular goal is to show some of the flares displayed by the blazar PKS 1510−089 in the optical and also in the γ-ray domain and see if we can find some connection between polarization variability and high-energy activity. PKS 1510−089 is a nearby ($z = 0.361$) FSRQ with the inverse Compton component dominated by the γ-ray emission, and the synchrotron emission peaked around IR frequencies. The relativistic jet of this blazar presents an angle of 2.58° with respect to the observer accordingly with D'Ammando et al. (2009).

In Figure 1 we show the Light Curves obtained in the optical and also the corresponding behavior observed with LAT. γ-ray data (0.1–200 GeV) were processed using the standard software (Atwood et al. 2009) and has been modeled using a power law for the photon flux. The γ-Light Curve shown has been binned in periods of 3 days. The large errors in the spectral index are due to a low count rate. From our optical data, we have estimated the variability timescale and found $\tau = 2.58$ days. From the figure it is clear that the source was in a flaring state in March 2009. This flare was also observed in the γ-rays with AGILE (D'Ammando et al. 2011) and with LAT. We can also observe a second γ-ray flare around December 15th 2009 and a second peak around January 12th 2010. Unfortunately, we did not get data on that time due to technical problems. On the other hand, there is also a pre-flare state around 54720 MJD (September 2008) observed with LAT that is partially covered by our optical data.

3. DISCUSSION

As preliminary results we should say that we have observed a 100% duty-cycle in total and polarized light and not preferred PA for this blazar. Also, Figure 1 shows that the source was on a very high activity state in the optical and in the γ-ray region around MJD 54945. This date corresponds to March 24 2009. We have the maximum polarized value for this date ($22.30 \pm 0.49\%$), and the maximum brightness of the source ($R = 15.18 \pm 0.03$). In this object there seems to be a correlation between the polarization degree and the flux in both bands.

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