

Monitoring of atmospheric dust with photoelectric photometer. Dust from icelandic volcanic ashes above Italy: evidence for too much alarmism on mass-media

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INSTRUMENTS used in this research

Hardware

owned by Osservatorio Astronomico di Capannori
(O.A.C.):

- Schmidt-Cassegrain Telescope with 30 cm aperture f/10
- Photoelectric photometer Optec SSP-5A second generation with photomultiplier tube Hamamatsu R6358 (low noise multialkali, red extended), with UBV filters

INSTRUMENTS used in this research

Software

owned by Osservatorio Astronomico di Capannori
(O.A.C.):

- *Optec SSPDataQ2*
for photoelectric data reduction

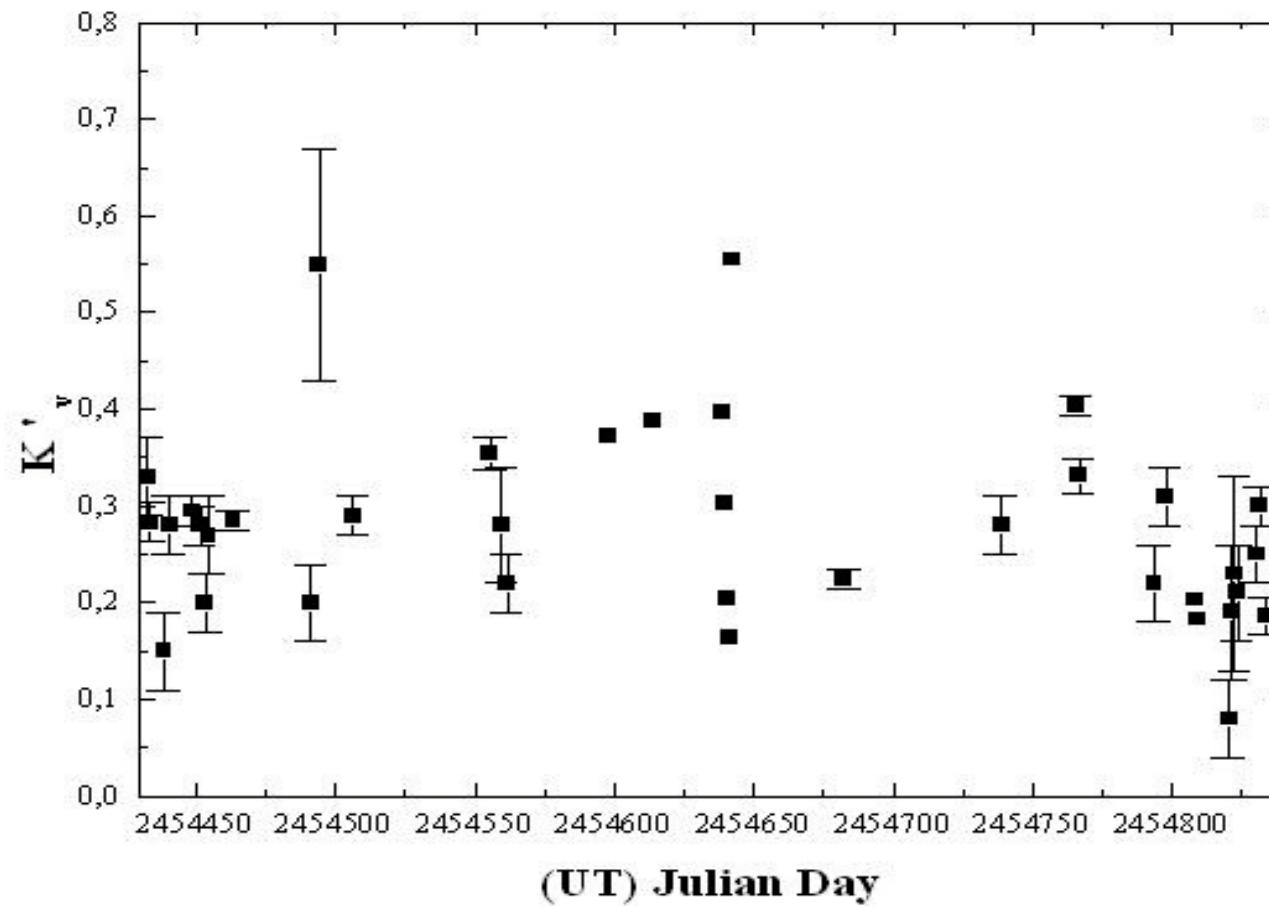
METHODS used in this research

- UBVR photoelectric photometry of standard stars
- Plot of Bouguer's lines (Langley plots)

Time series of K'_v coefficient

Atmospheric extinction coefficient K'_v versus time.

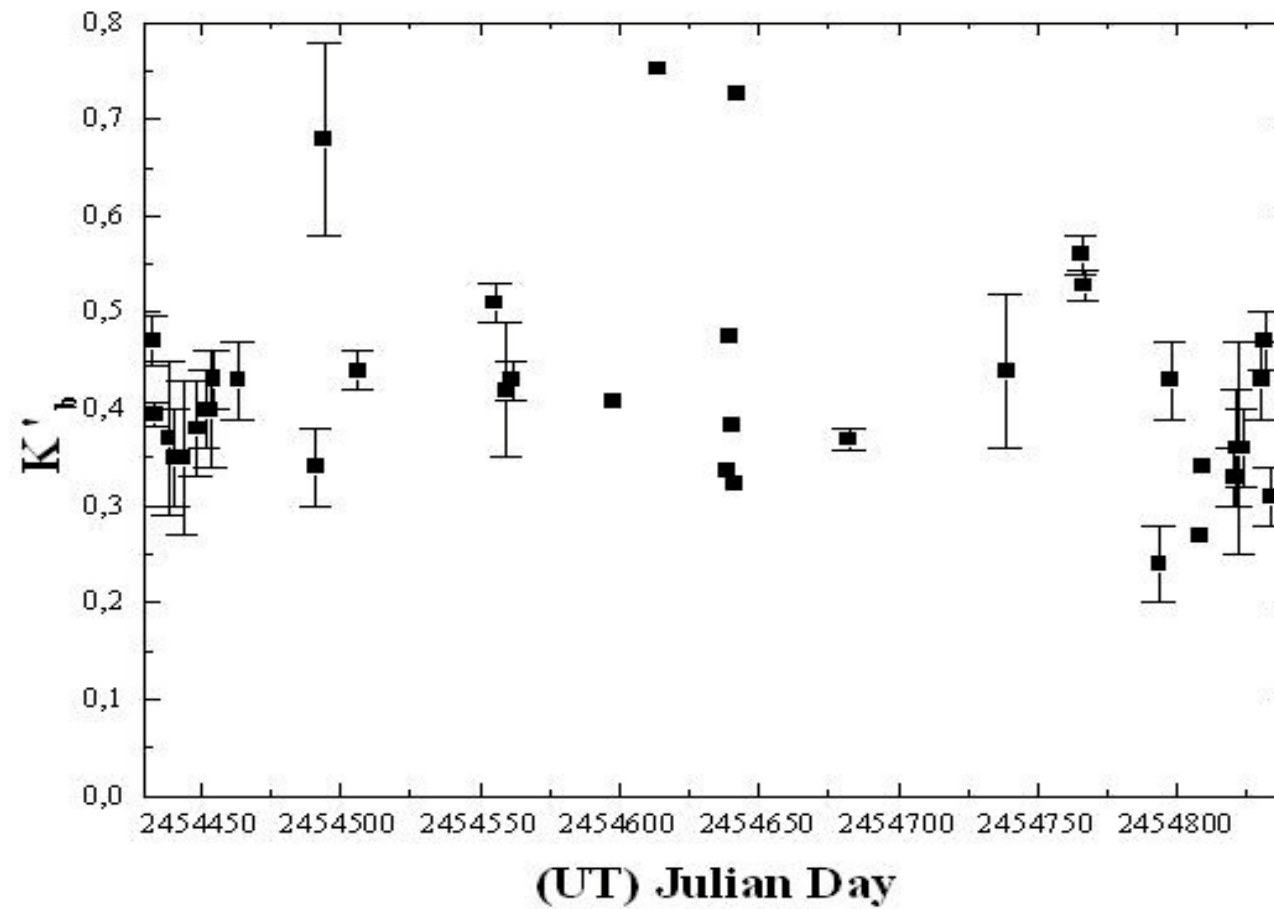
Band: V. Site: Lucca Time range: 27 Nov 2007 - 1 Jan 2009.



Time series of K'_b coefficient

Atmospheric extinction coefficient K'_b versus time.

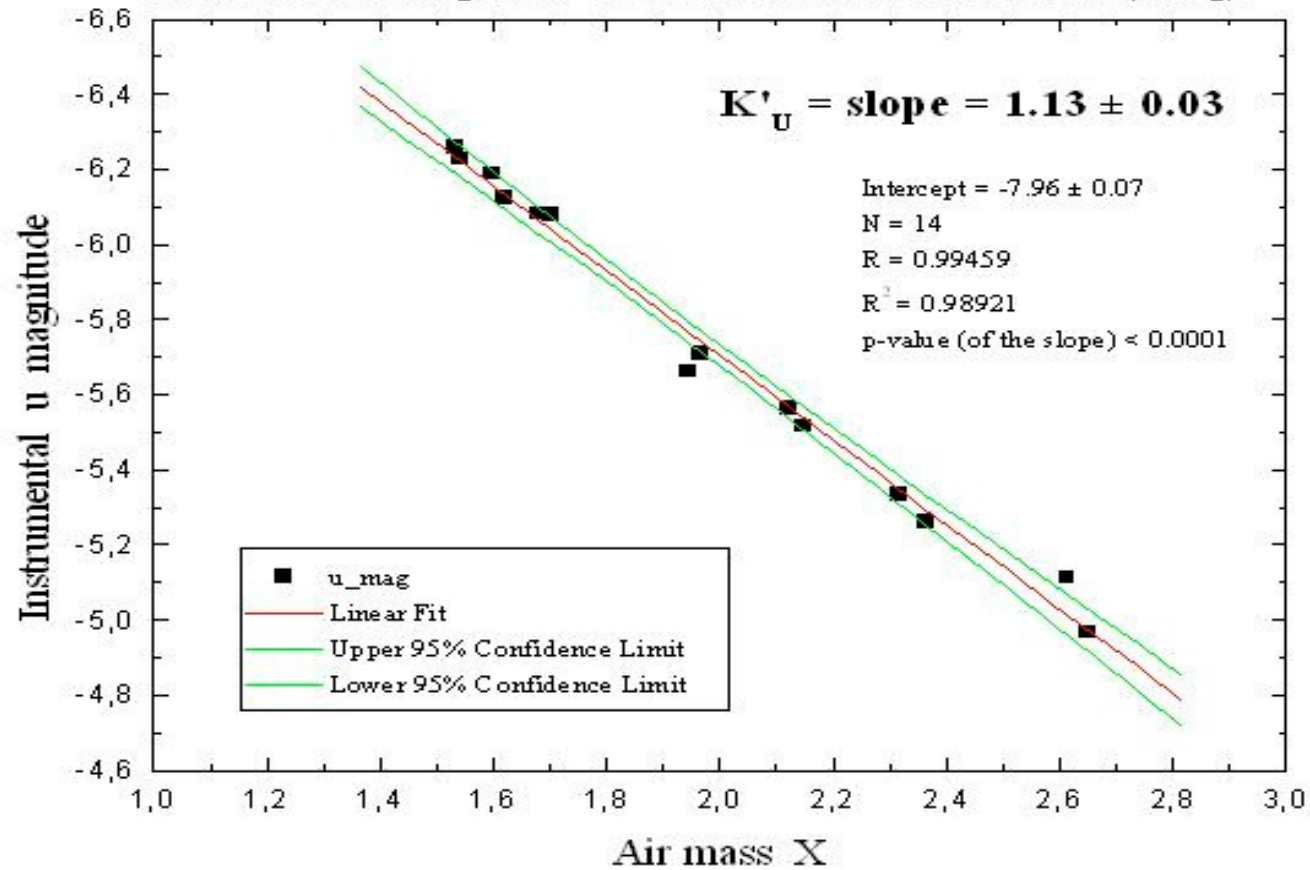
Band: B. Site: Lucca. Time range: 27 Nov 2007 - 1 Jan 2009.



Bouguer line with dust in the sky: U band

Determining K'_U with the method of Bouguer's line.

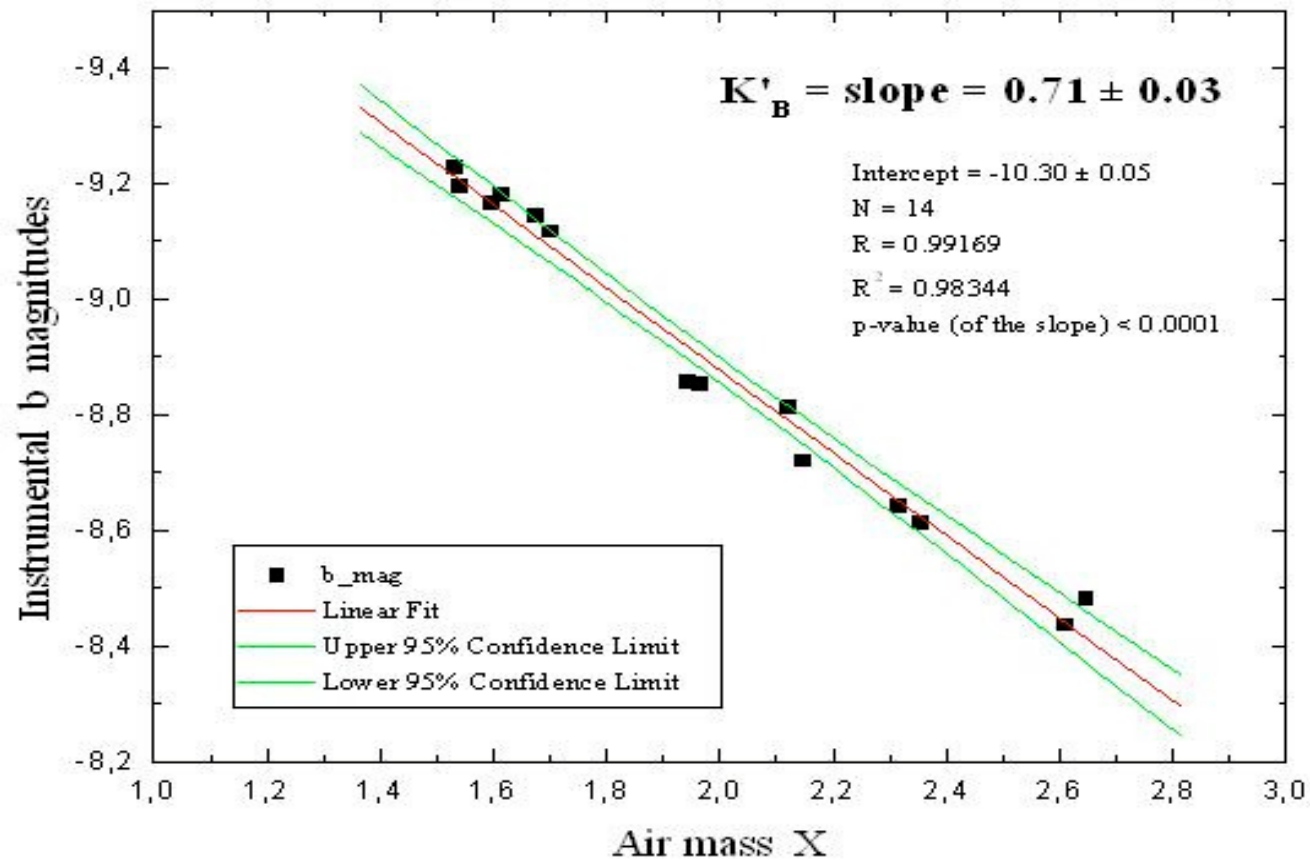
Band: U. Date: August 23rd 2009. Site: Lucca. Star: M45 F (rising).



Bouguer line with dust in the sky: B band

Determining K'_B with the method of Bouguer's line.

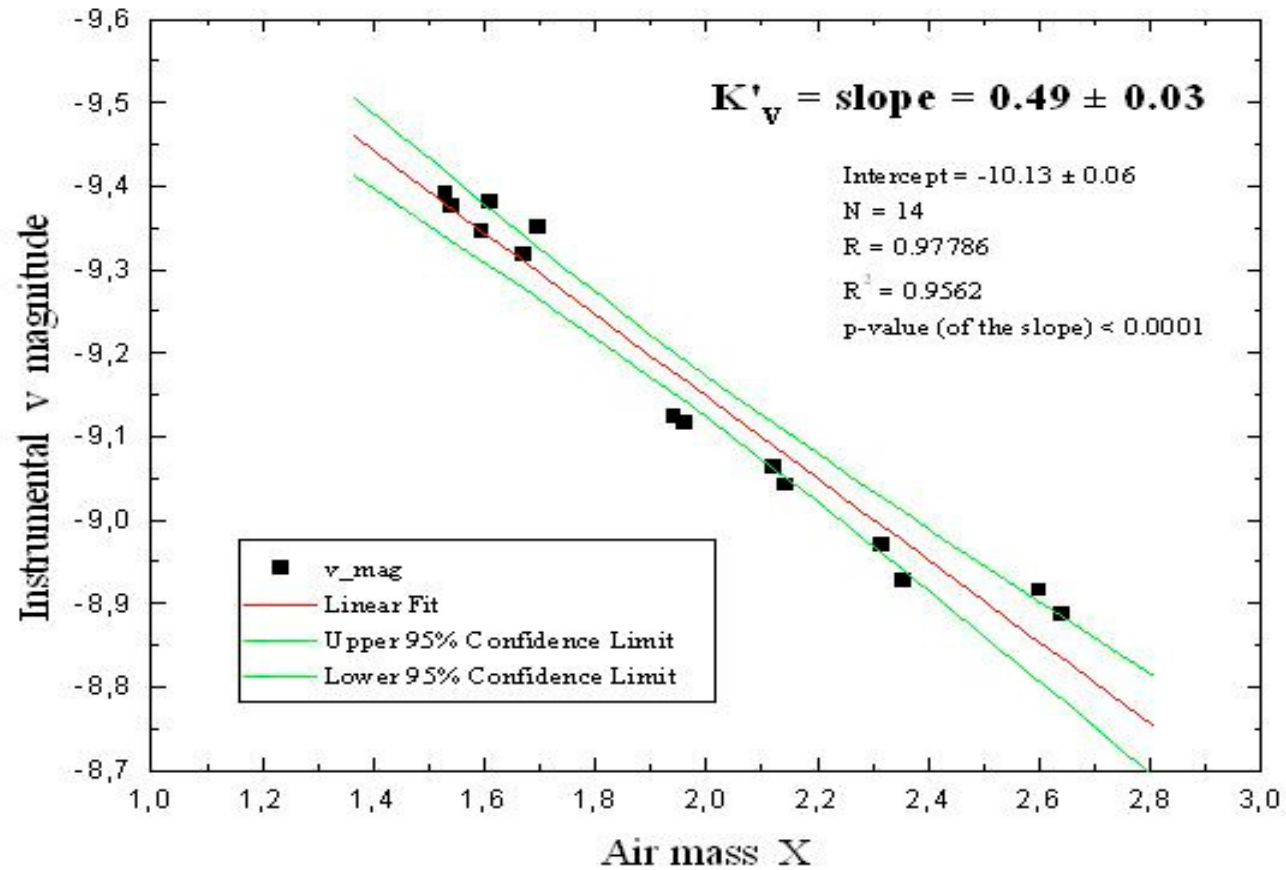
Band: B. Date: August 23rd 2009. Site: Lucca. Star: M45 F (rising).



Bouguer line with dust in the sky: V band

Determining K'_v with the method of Bouguer's line.

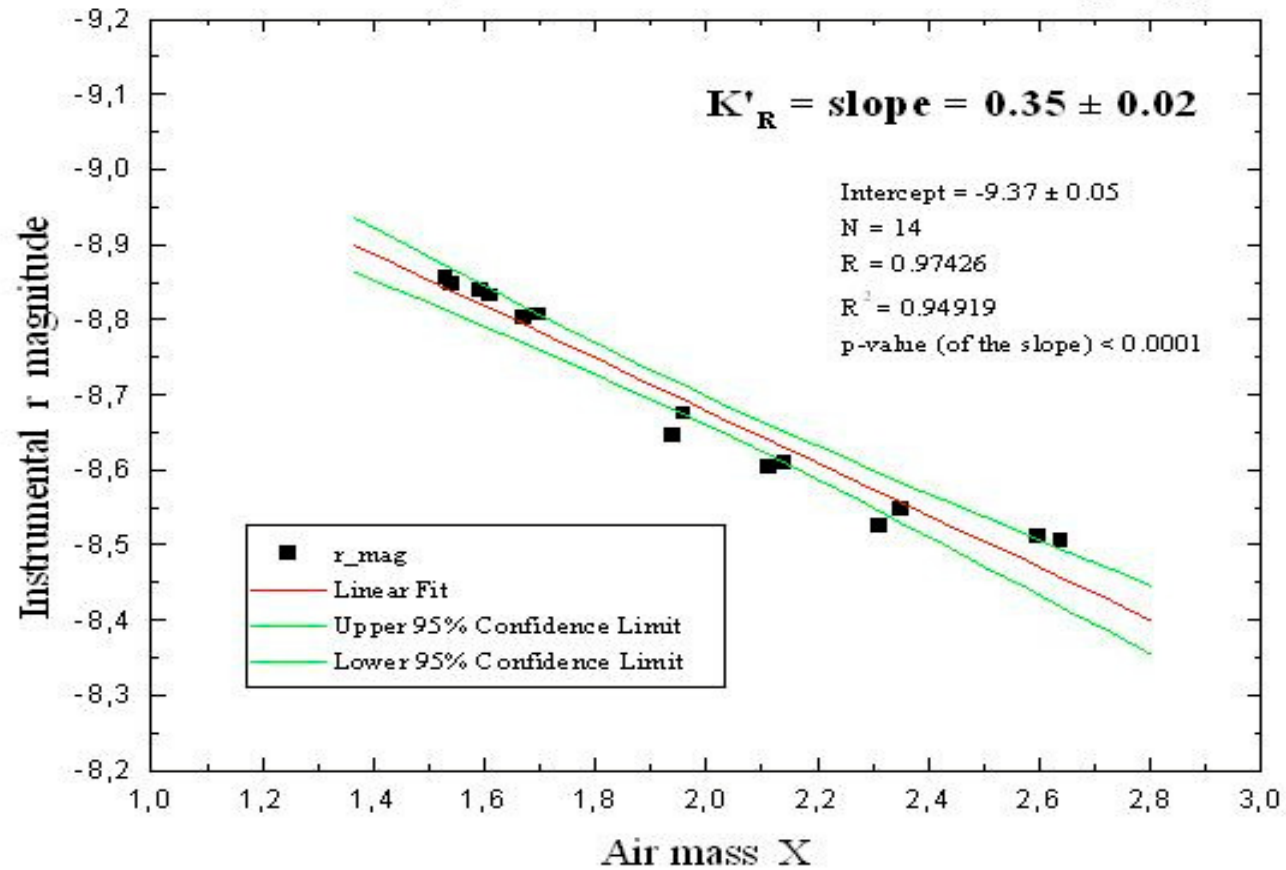
Band: V. Date: August 23rd 2009. Site: Lucca. Star: M45 F (rising).



Bouguer line with dust in the sky: R band

Determining K'_R with the method of Bouguer's line.

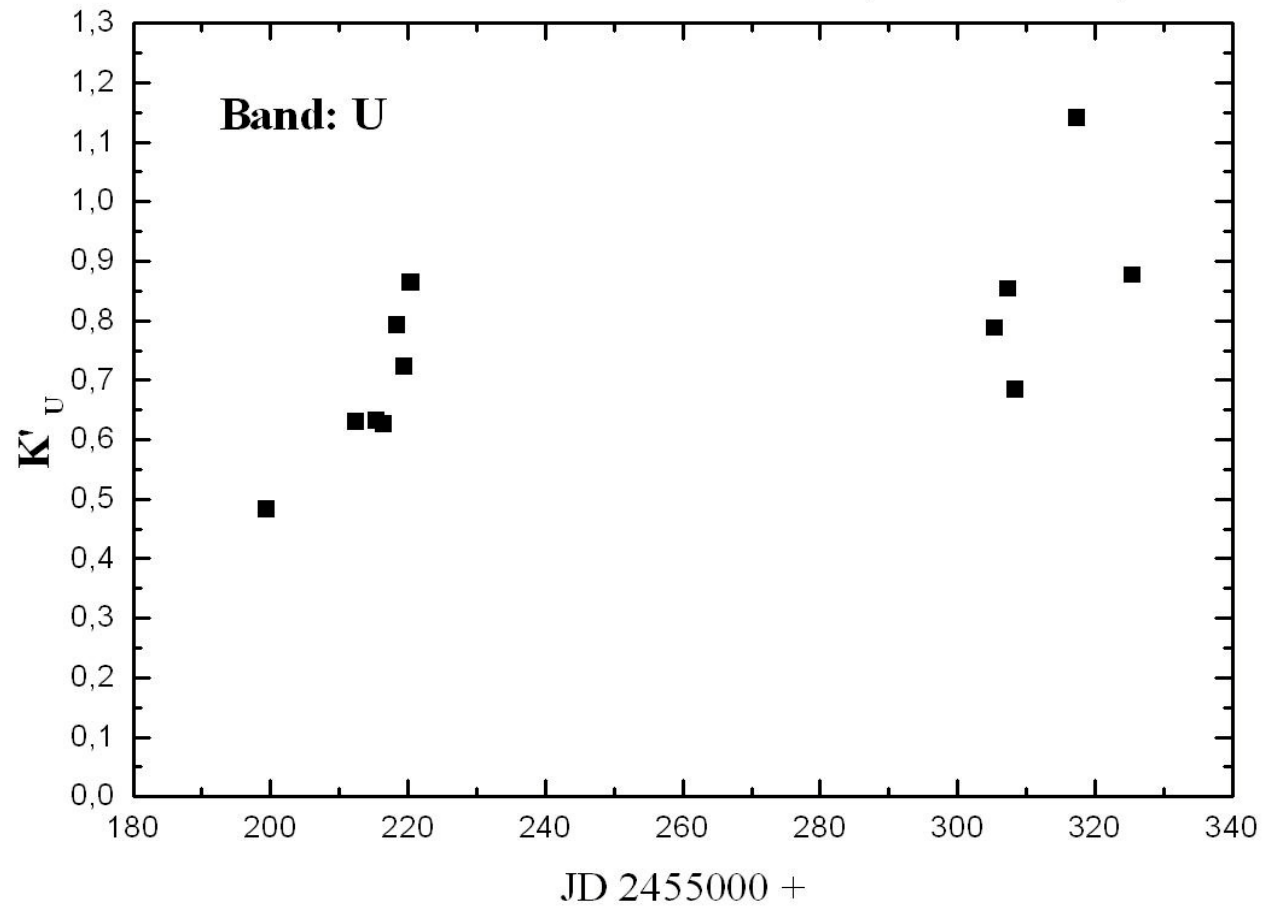
Band: R. Date: August 23rd 2009. Site: Lucca. Star: M45 F (rising).



U band: time series of K' in 2010

Time series of K'_U from January 2nd to May 8th 2010

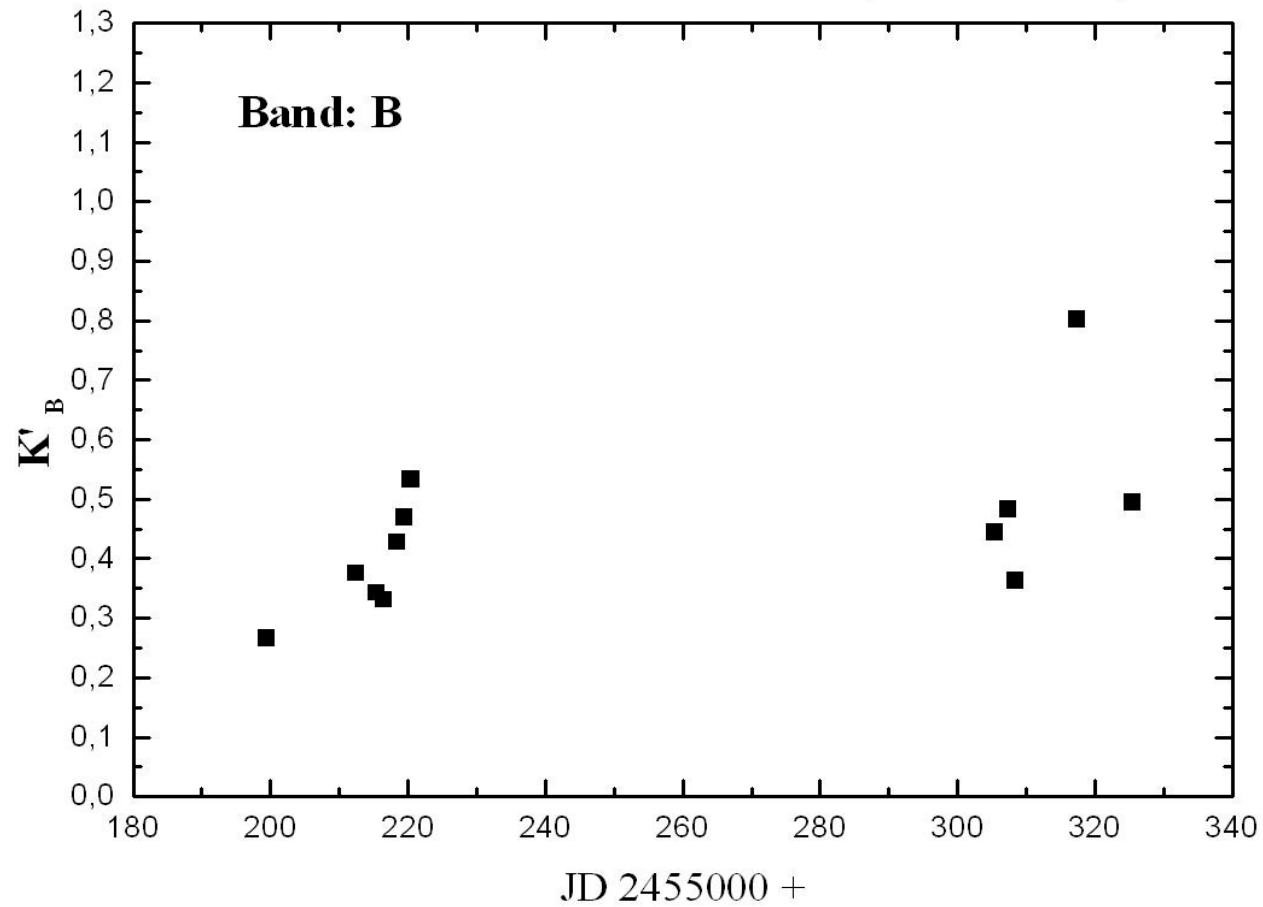
Site: Lucca. Instruments: OAC 0.30-m telescope and SSP-5A photometer



B band: time series of K' in 2010

Time series of K'_B from January 2nd to May 8th 2010

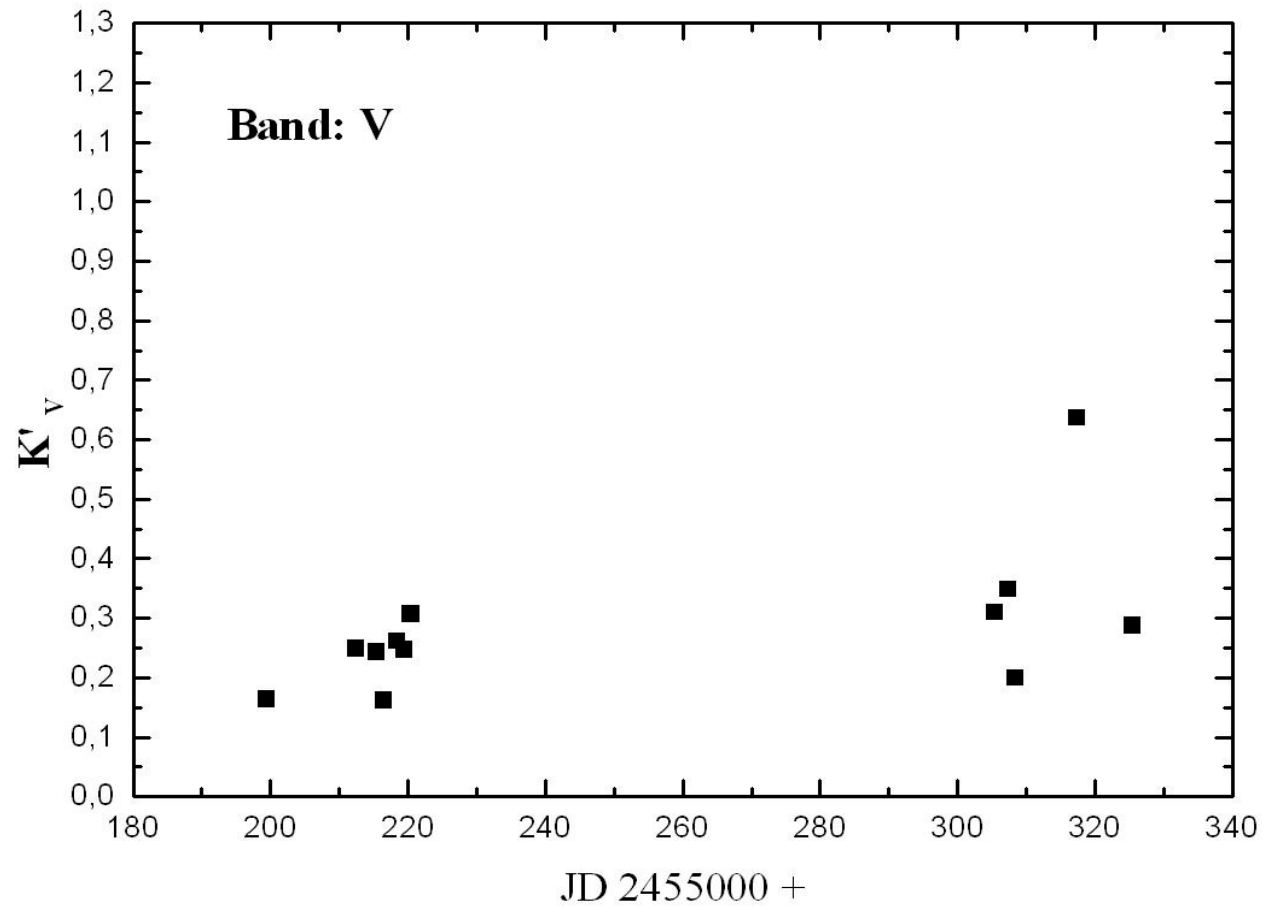
Site: Lucca. Instruments: OAC 0.30-m telescope and SSP-5A photometer



V band: time series of K' in 2010

Time series of K'_V from January 2nd to May 8th 2010

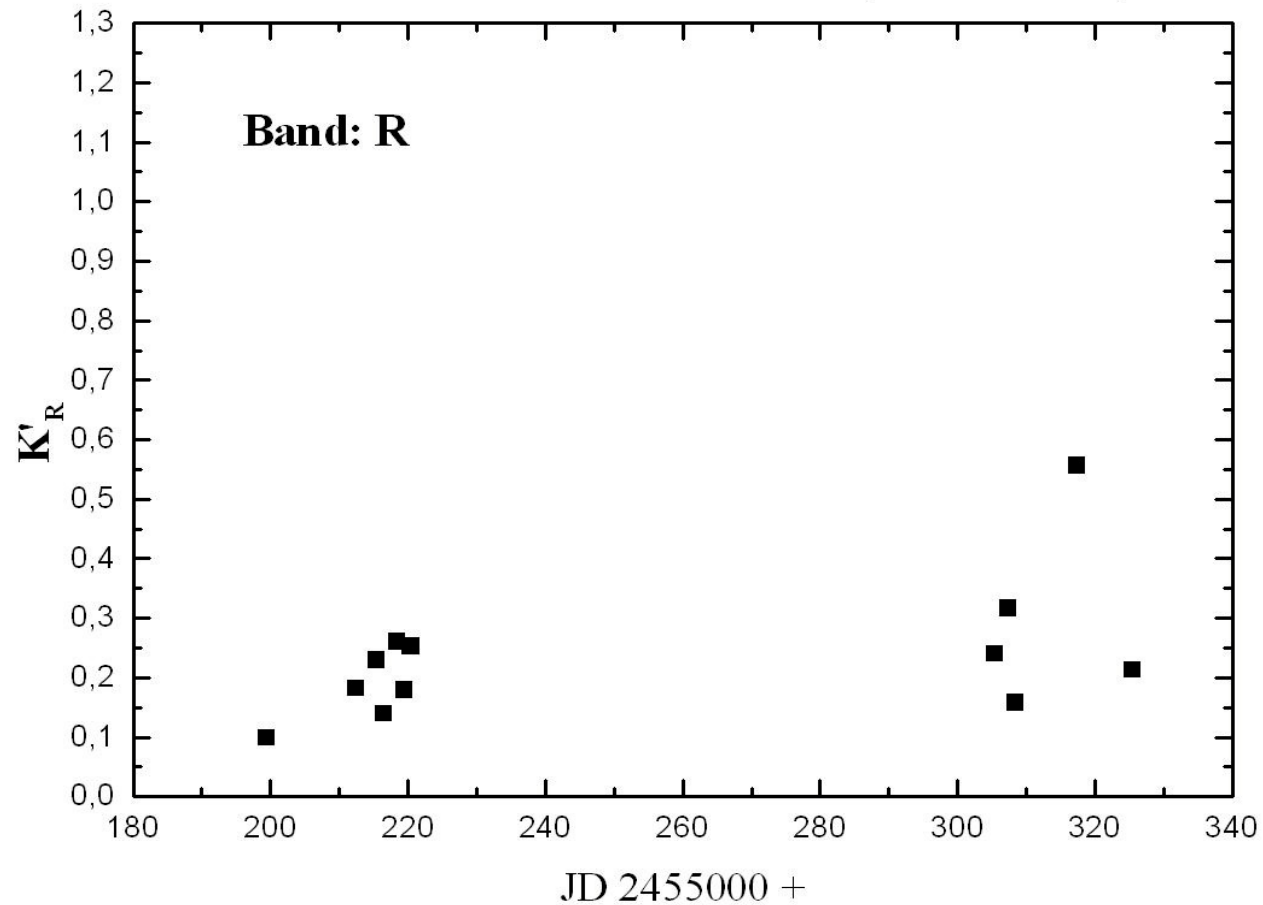
Site: Lucca. Instruments: OAC 0.30-m telescope and SSP-5A photometer



R band: time series of K'_R in 2010

Time series of K'_R from January 2nd to May 8th 2010

Site: Lucca. Instruments: OAC 0.30-m telescope and SSP-5A photometer



Conclusions

- Since about 3 years OAC started a program for long term monitoring of first order atmospheric extinction coefficient K' in the UBV_R photometric bands; until now we have performed measurements in 181 nights, obtaining valid results in 165 of them.
- From crossed checks with LIDAR data from IFAC-CNR of Sesto Fiorentino we found that K' measurements with Langley plots from OAC show very good correlations with LIDAR measurements.
- Particularly, OAC measurements show clear peaks in correspondence to saharian dust waves detected by IFAC-CNR LIDAR.
- About measurements performed from April to May 2010, in conjunction with the predicted volcanic dust waves from Iceland, we have not found any significant growth of K' , except of a feeble growth (close to the detection limit) on April 20th night; these findings are in excellent agreement with data from IFAC-CNR which showed detectable dusts only in two occasions in the above mentioned time range.