

# Ground Observations of PMS stars candidates to the COROT Additional Program

Sérgio L. A. Vieira<sup>1,2</sup> Jane Gregório-Hétem<sup>3</sup> Wagner J. B. Corradi<sup>4</sup>  
Gustavo Rojas<sup>1</sup> Jacques R. D. Lépine<sup>1</sup> Sílvia H. P. Alencar<sup>4</sup>

1) Centro Universitário UNA 2) FEAMIG 3) IAG-USP 4) Departamento de Física - ICEx - UFMG

## Abstract

The Pico dos Dias Survey (PDS), a search for T Tauri (T Tau) stars based on IRAS colors (Gregorio-Hetem et al. 1992; Torres et al. 1995; Torres 1999) has revealed several new T Tau stars as well as other very interesting objects, such as 108 Herbig Ae/Be (HAeBe) candidate stars (Vieira et al. 2003).

The main goal of this project is to better understand the variation of T Tau and HAeBe stars due to interaction with circumstellar matter. Therefore, to achieve better results with the COROT space mission, it is necessary to do a careful preparation based on ground observations.

In this poster we will present the results obtained by our group, based on BVRI photometric data collected at Laboratório Nacional de Astrofísica (LNA, Brazil), to select better candidates to the COROT Additional Program.

## Introduction

Pre-main sequence stars (PMS) such as T Tauri (T Tau) and Herbig Ae/Be (HAeBe) stars present photometric and spectroscopic variations due to the interaction between the star and the circumstellar medium.

For some stars, variations in  $H\alpha$ ,  $H\beta$  and  $\text{Na I D}$  are correlated with photometric variations, as was observed in HD 100546 (Vieira, 1999). In this case, the event is explained by the evaporation of a gaseous structure. Similar events observed in other stars were explained as a consequence of planetesimal or cometary bodies crossing the line of sight (Grinin, 1994 and de Winter, 1999).

In this work we present a preliminary result for photometric variations in PMS stars selected in the PDS program (Gregório-Hétem et al. 1992; Torres et al. 1995; Torres 1999). The main goal of this project is to select better candidates to the COROT Additional Program.

## Observations

The data were collected during six nights in July 2004 using the IAG 60 cm telescope from Laboratório Nacional de Astrofísica (LNA, Brazil) together with a  $1024 \times 1024$  CCD and BVRI filters.

The data were collected in a way that comparison and program star were located in the same frame (Fig. 1). Standard stars were also used as extinction.

Data reduction and aperture photometry were made in a standard way using IRAF package.

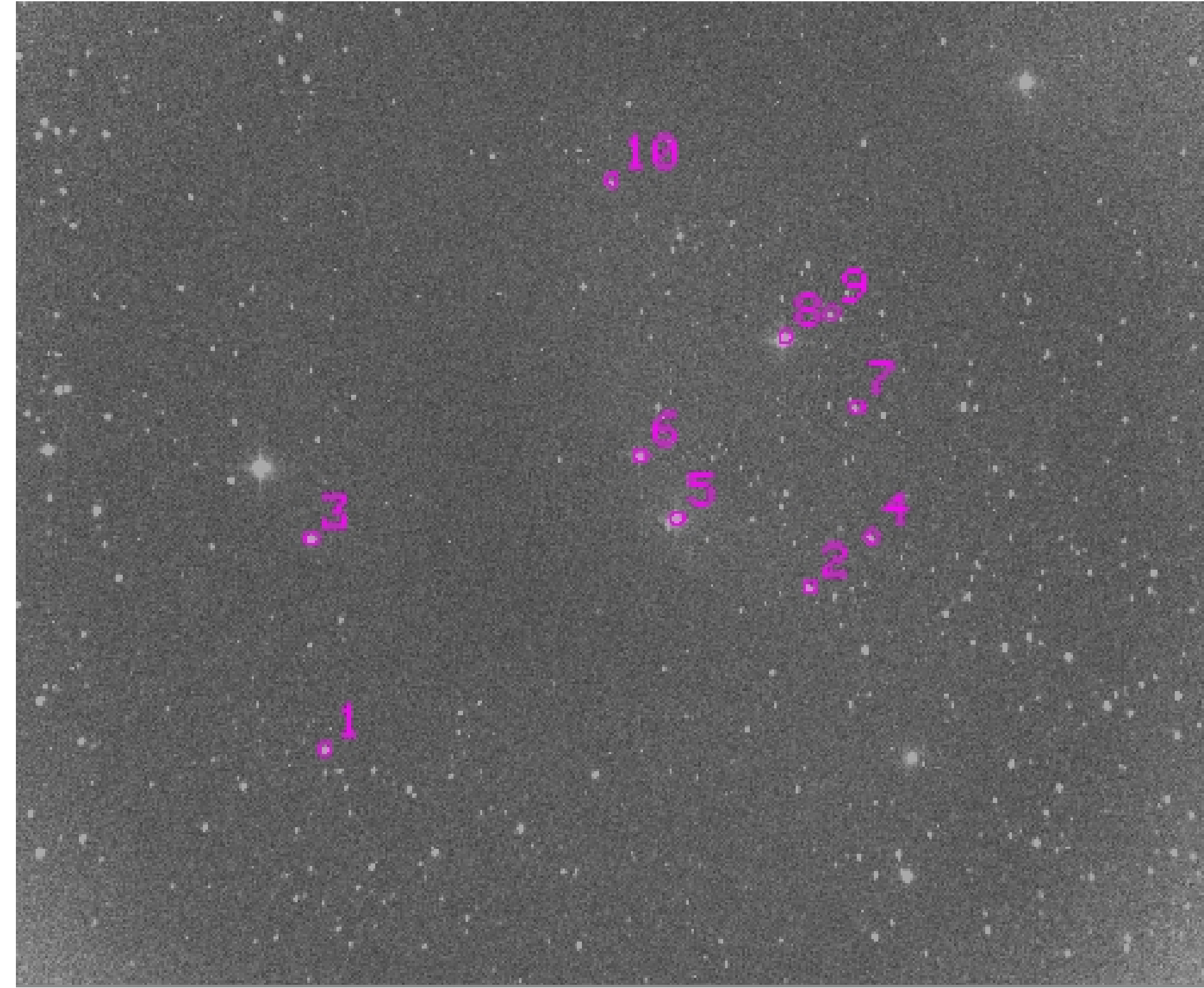


Figure 1: Sample of one of the fields observed. In this frame are the PMS stars PDS 090 (number 5), PDS 091 (number 6) and comparison stars.

## Results

The light curves for the two studied PMS stars are presented in Figures 2 and 3. Stars number 2 and 4 were chosen as comparison stars because their brightness remained constant within the precision.

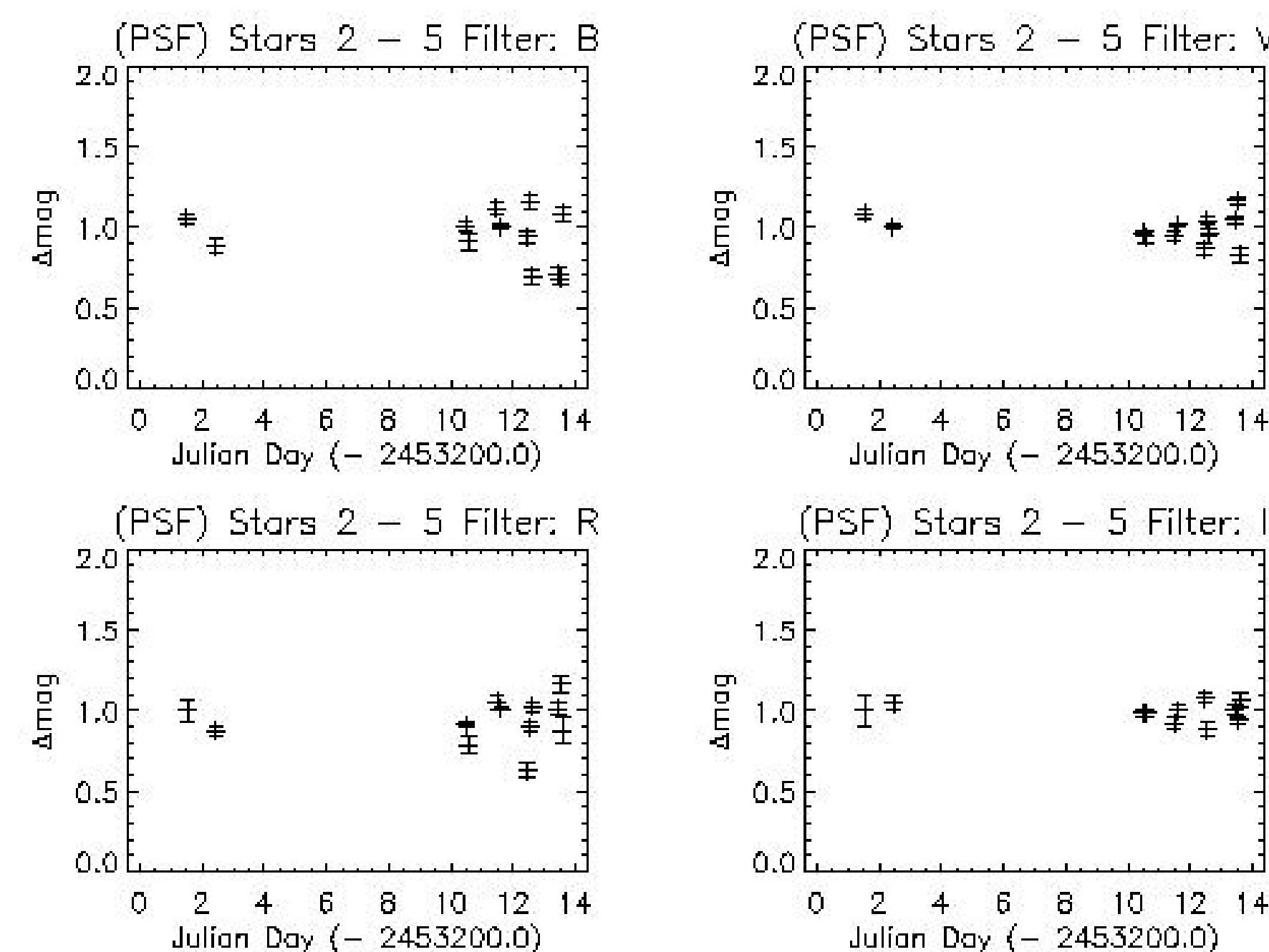


Figure 2: Light curve for PDS 090, in the four filters.

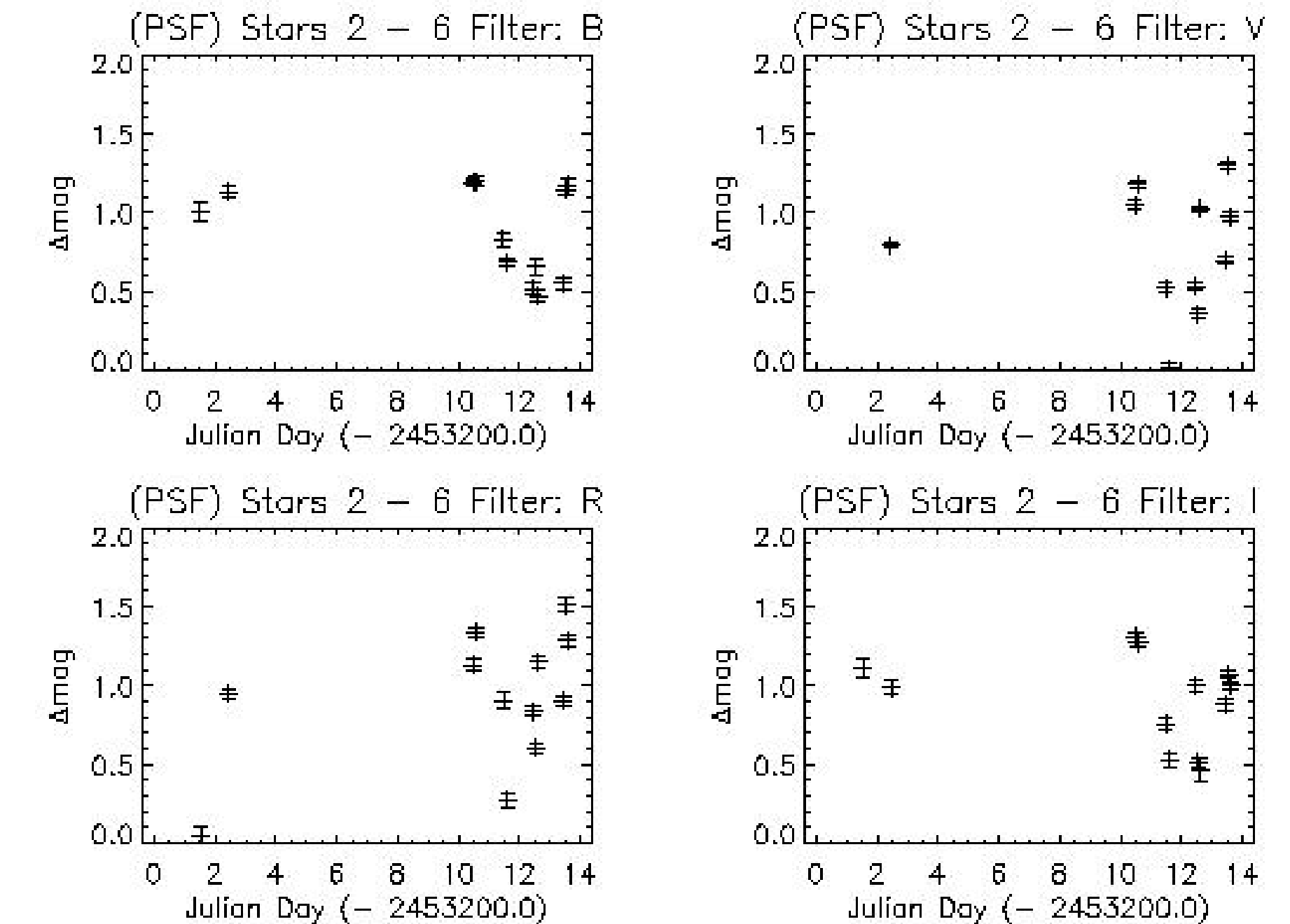


Figure 2: Light curve for PDS 091, in the four filters.

Both PDS090 and PDS091 show variation of about one magnitude. To state if this variability is periodic or not will require further monitoring of these objects. Although PDS091 is not in the first data selection it reveals itself as a better candidate to COROT additional program star.

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