Cláudia Vilega Rodrigues

Abril/2014

Workshop da DAS

Objetivo

* Apresentar rapidamente
  - Tópicos de pesquisa
  - Atividades 2013
  - Planejamento 2014

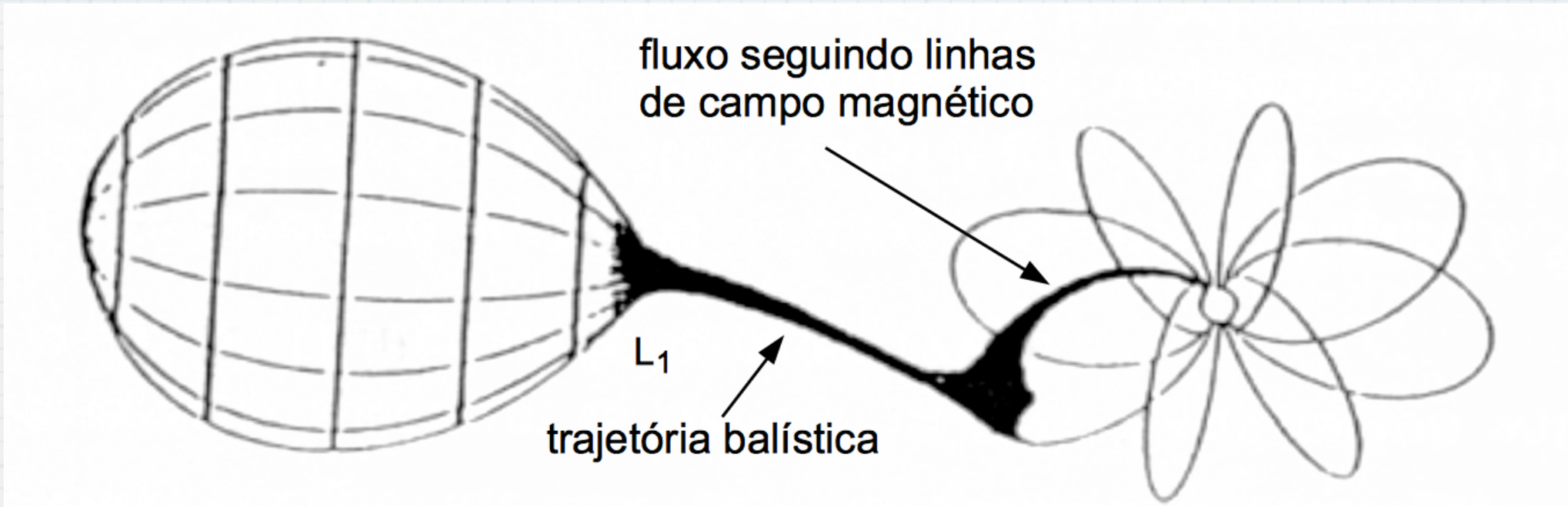
2013 em 1 slide

* 4 entradas no ADS
  - 3 artigos: 2 ApJs e 1 MNRAS
  - 1 trabalho completo em proceedings (publicação 2014)
* SPARC4 - submissão de temático à Fapesp
* 1 orientação (concluída em 2013)
* 1 pesquisador visitante - Fapesp
* Coordenação PG/AST
* Técnicas Observacionais em Astrofísica
* Bolsa Produtividade CNPq - Nível 2
* CPs: SOAR e CFHT - atualmente presidente da CP

Variáveis cataclísmicas, com ênfase nas magnéticas

Polares

- Observações: fotometria, polarimetria e espectroscopia
- Modelos ópticos e raios X



Cropper (1990)

* Modelos para emissão de polares no óptico e em raios X
* Principais colaboradores
  - Joaquim E. R. Costa
  - Karleyne M. G. da Silva

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MNRAS Advance Access published May 2, 2013

MNRAS (2013)

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Stokes imaging of AM Her systems using 3D inhomogeneous models – II. Modelling X-ray and optical data of CP Tucanae★

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ABSTRACT

The viewing geometry of the polar CP Tuc that better explains its optical and X-ray light curves is controversial. Previous modelling of white-light polarimetric data considered the partial self-eclipse of an extended inhomogeneous emitting region. Alternatively, phase-dependent absorption has been used to reproduce the X-ray data. This paper presents new optical polarimetric data of CP Tuc and a model that consistently explains its optical and X-ray data. The model was based on an extension of the CYCLOPS code that added X-ray bremsstrahlung emission and pre-shock region absorption to the original version, which only accounted for cyclotron emission. The new code creates the possibility of simultaneous optical and X-ray fitting. We show that self-eclipse and absorption data have distinct signatures on the X-ray spectra. Although we were able to reasonably fit the CP Tuc optical data to cases of absorption and self-eclipse, we were only able to reproduce the X-ray orbital modulation after considering the absorption in the pre-shock region. Specifically, we were unable to reproduce the X-ray observations in the self-eclipse case. We found that the primary emitting region in CP Tuc is located near the rotation pole that approximately points to the observer.

Karleyne M. G. Silva - doutorado

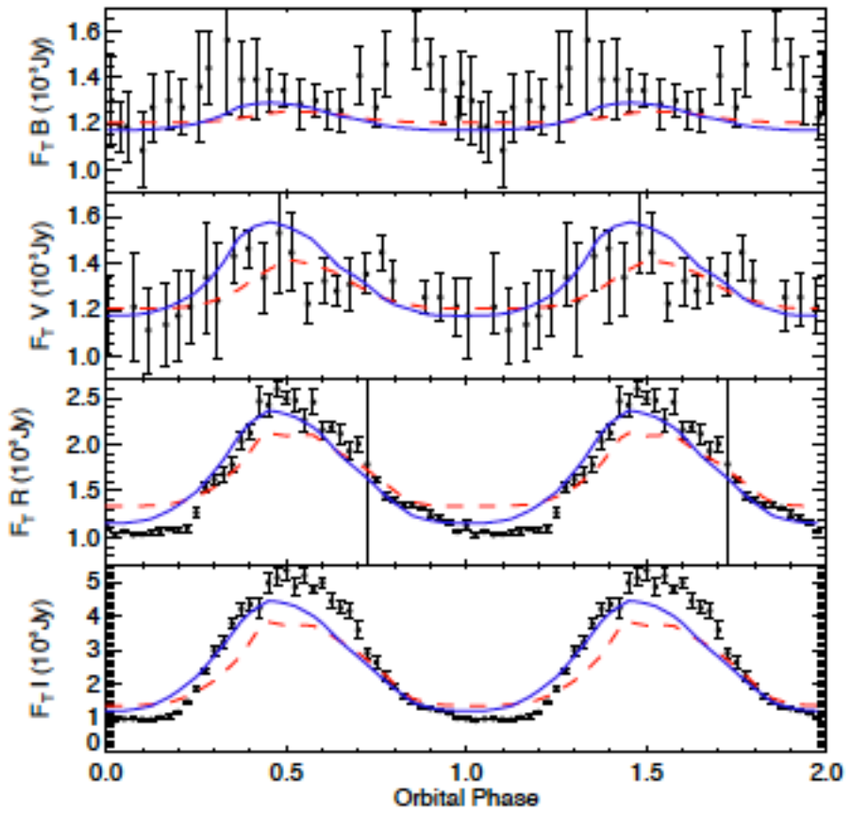


Figure 8. Optical light curves of CP Tuc combined in 40 phase bins. From top to bottom: B, V, R_c and I_c bands. The lines indicate the models Abs2 (red, dashed line) and Abs3 (blue, solid line).The B and V data are from Ramsay et al. (1999).

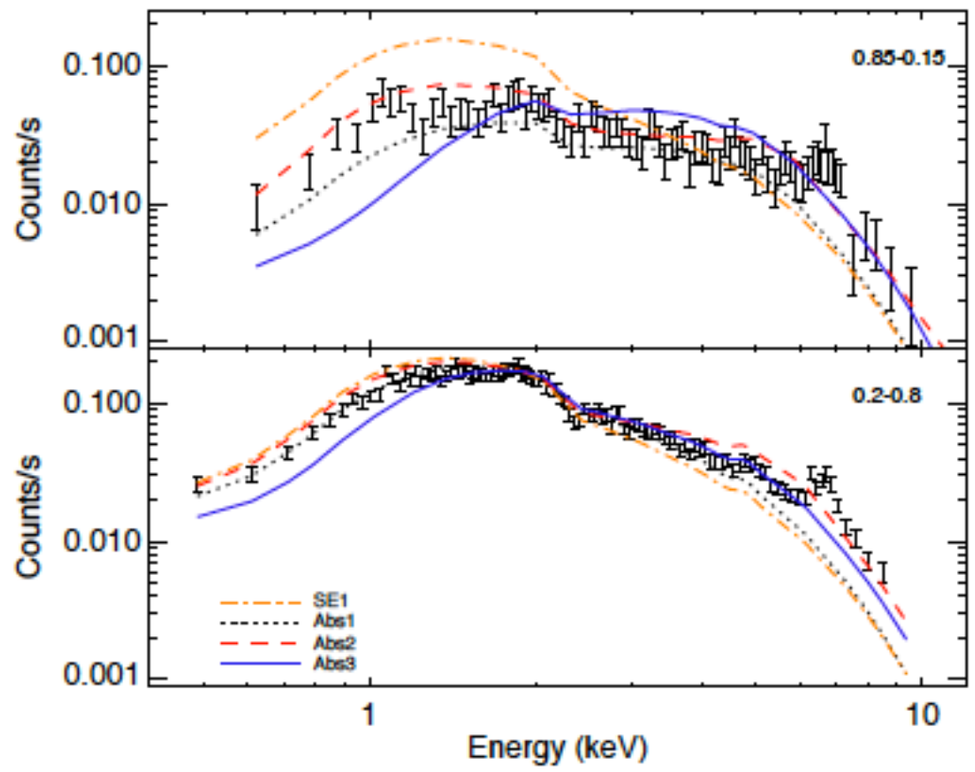


Figure 10. X-ray phase resolved spectra in arbitrary units of CP Tuc for phase range 0.85-0.15 (top panel) and 0.2-0.8 (lower panel). The lines represent the models.

Óptico

Raios X

Observação de polares

* Obtenção de dados
  - polarimétricos - LNA
  - espectroscópicos - SOAR
* Colaboração com
  - Alexandre S. de Oliveira
  - Deonisio Cieslinski
  - Francisco Jablonski
  - Karleyne M. G. Silva
  - Leonardo A. Almeida

Silva et al. 2014, LARIM, Artigo em preparação

Nova polar descoberta pelo grupo.

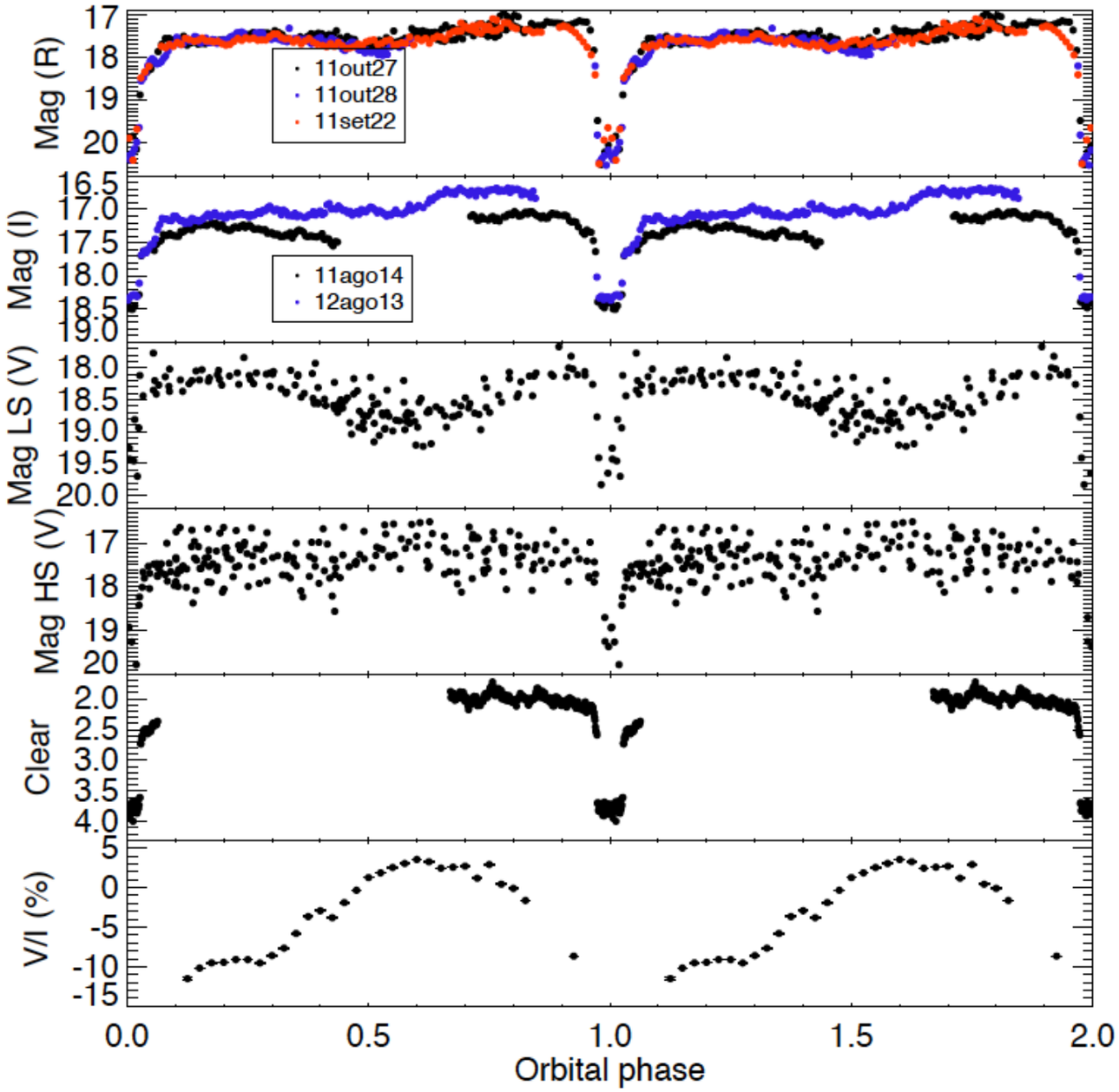


Fig. 1. From top to bottom: R, I, V (low state) and V (high state) bands light curves and R-band circular polarimetric curve of MLS110213.

Formação estelar

Formação estelar

* Trabalhos com ênfase no mapeamento do campo magnético interestelar
* Colaboração
  - Victor de S. Magalhães
  - Antonio Pereyra
  - German Racca
  - Williams Vilas Boas

Rodrigues et al. 2014, IAUS 302, in press

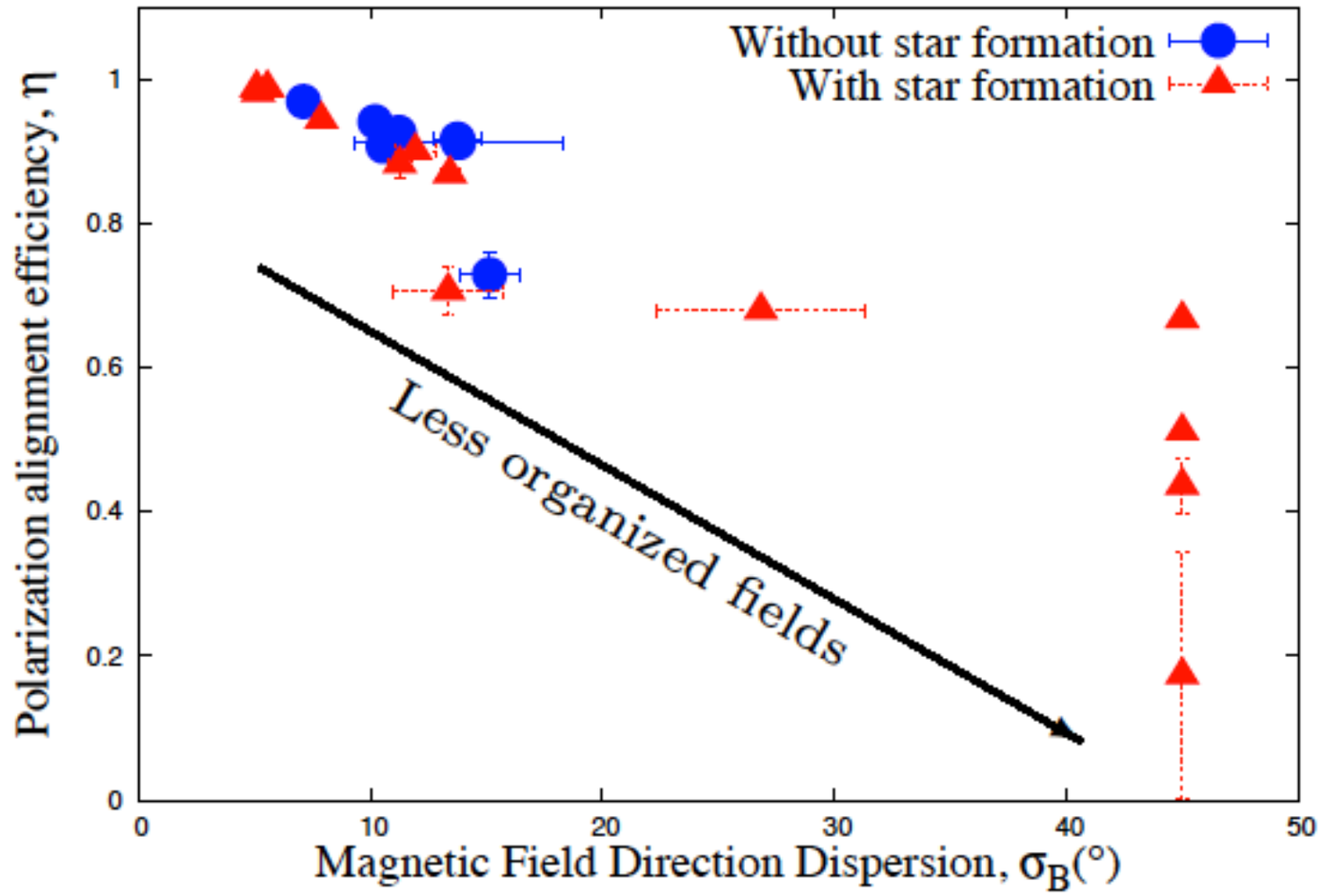
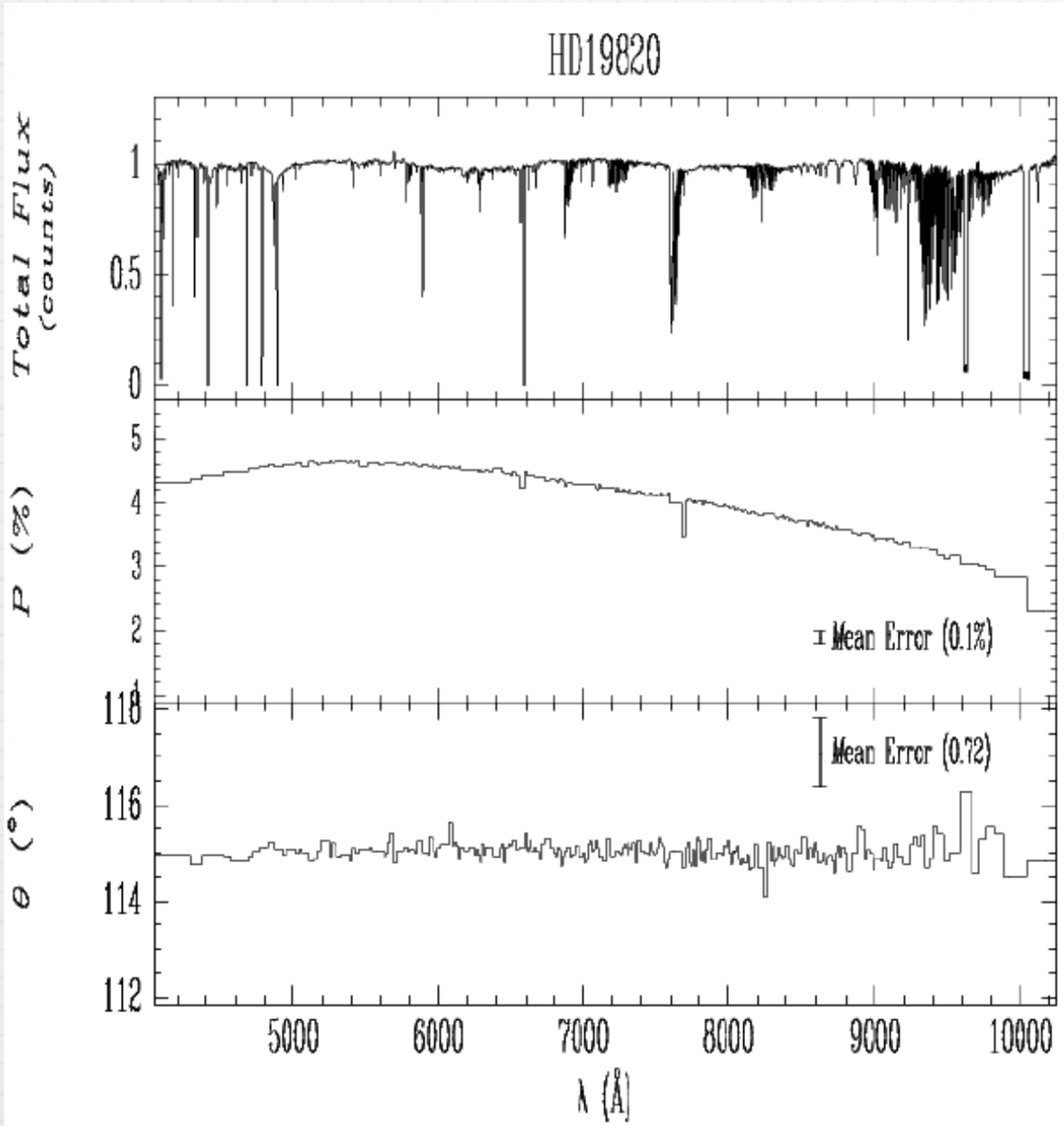


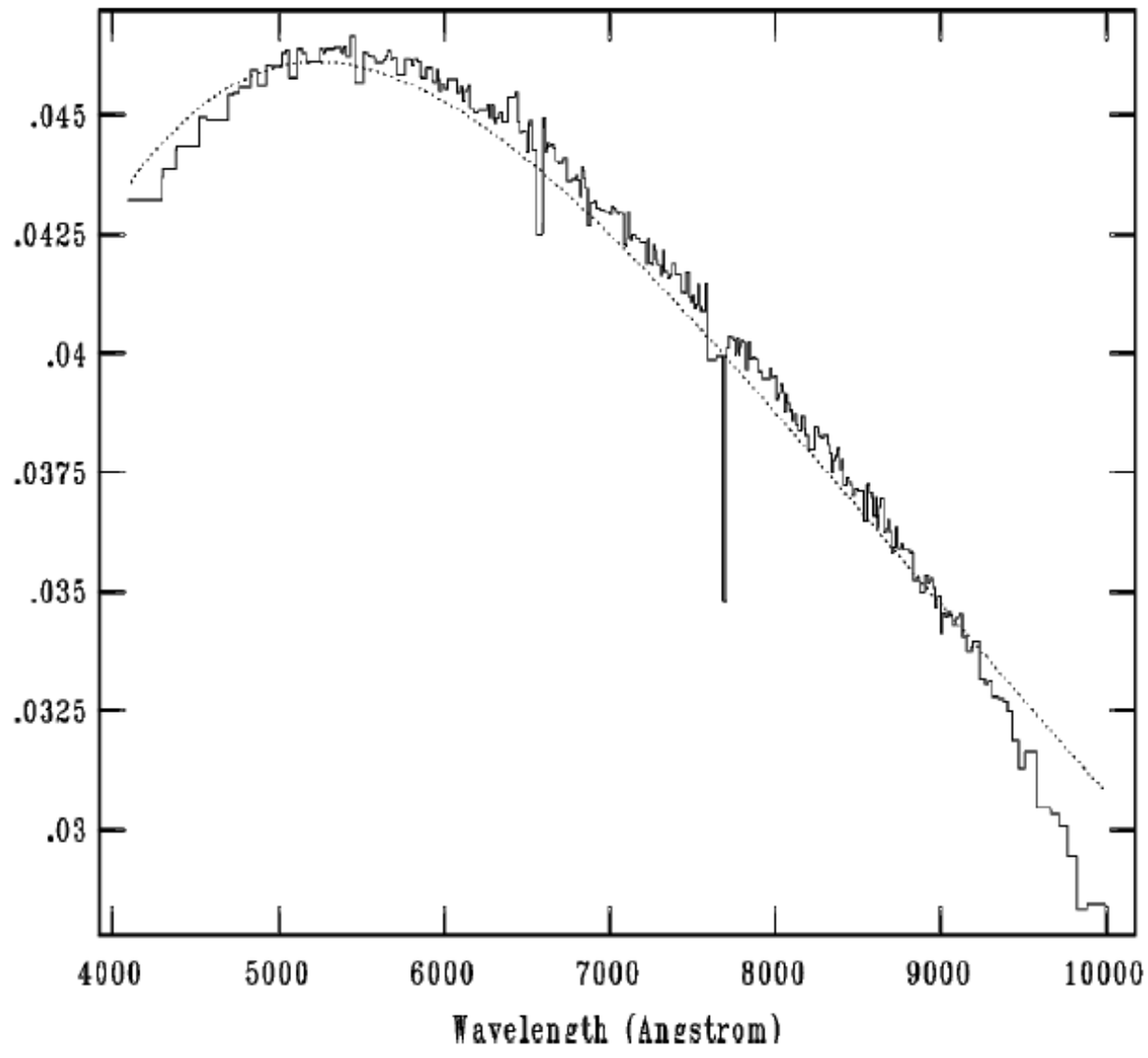
Figure 3. Polarisation alignment efficiency, η, and DMFD, σ_B, for star forming globules (red triangles) or quiescent globules (blue circles).

Polarimetria no contínuo com Espadons

* É possível medir polarização com o espectropolarímetro Espadons/CFHT



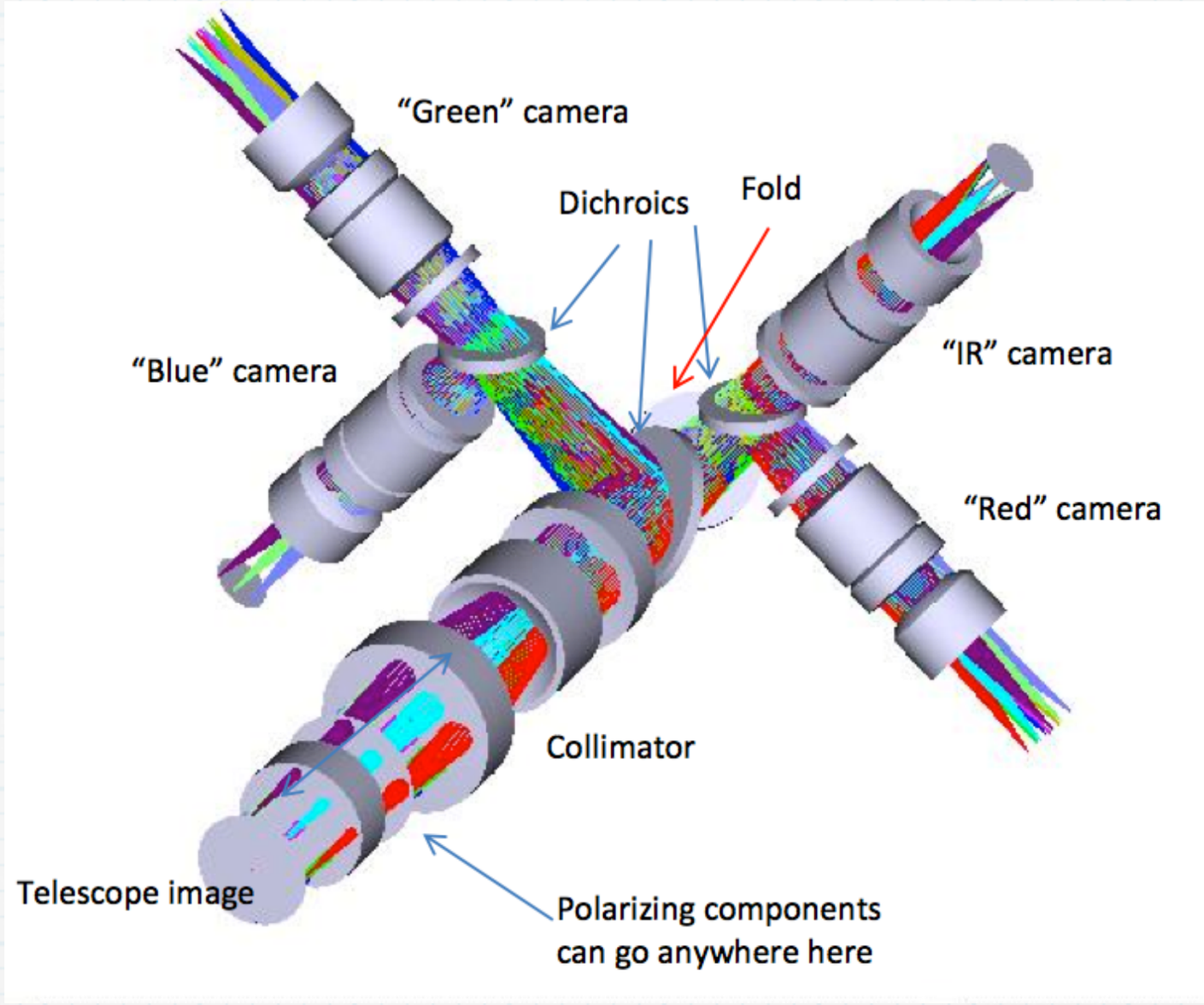
Pereyra et al. 2014, em revisão



Instrumentação astronômica

SPARC4

SPARC4



* Projeto de instrumento para telescópio 1.6m do OPD
* Câmera 4 bandas simultâneas (griz)
  - polarimetria
  - resolução temporal da ordem/melhor que 1s

2013

* Em busca de financiamento para construção
  - INPE - Projeto de Vulto CEA/2014
    * detetores
  - LNA
    * dicróicos
- Universal-CNPq/2013
  * projeto não apoiado
- Temático Fapesp
  * em análise

Perspectivas 2014

* 1 artigo submetido, em revisão
  - é necessário publicar mais...

* Início construção SPARC4?

* novas orientações

Obrigada!

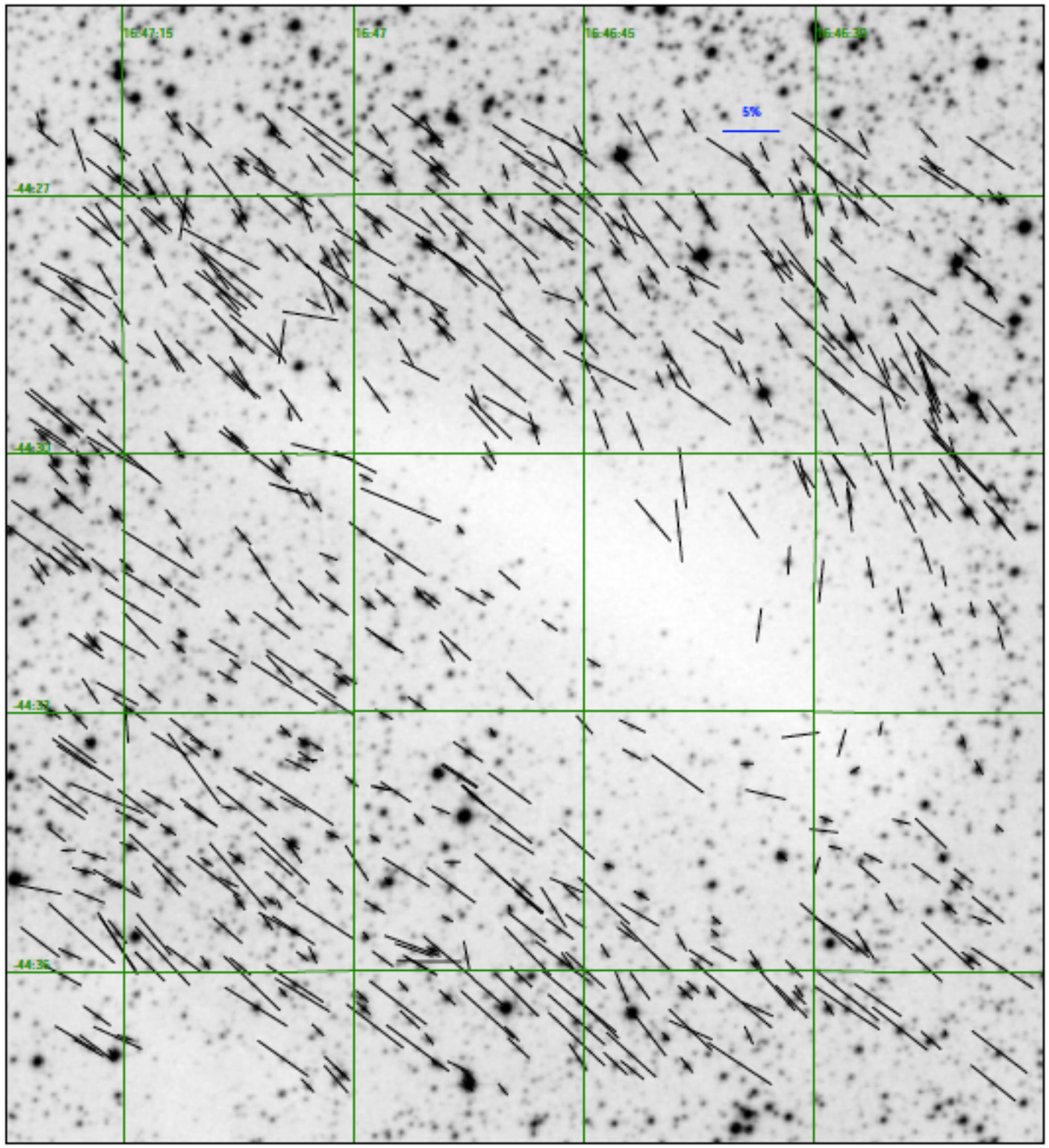


Figura A.14 - Mapa de polarização de BHR 133 na banda I_c sobreposto à imagem DSS2-Red da região.

The Conceptual Design Study produced solutions to all SPARC4 sub-systems demonstrating that the project is feasible. The estimated total cost of the instrument is approximately US$ 600k.

Telescope f#	f/10
Telescope aperture	1.6 m
Final f#	f/5
Main detectors	Andor Ixon(EM)-888
Pixels	1024 x 1024
Pixel size	13 μm (side)
Field of view	5.6 arcmin
Final platescale	0.0254 arcsec/μm
	0.35 arcsec/pixel
Bands	Sloan griz
Weight	175 kg
Modes of operation	photometry & polarimetry
Time resolution	$<$ 1 s (photometric mode - entire detector - fast readout)
Limiting magnitudes (SNR = 10)	19, 21, 21.8 for t_{exp} = 1, 10, 300s, respectively

16. Personnel

The SPARC4 team is composed by people with technical responsibilities in the project and by researchers who define the scientific requirements of the instrument.

Alex Carciofi (IAG/USP)	Scientist
André de Castro Milone (INPE/MCT)	Scientist
Antonio Kanaan (UFSC)	Scientist
Antonio Mario Magalhães (IAG/USP)	Polarimetric Instrumentation Specialist
Antonio Pereyra (IAC/Spain)	Scientist
Cesar Strauss (INPE/MCT)	Control and Acquisition Software
Claudia Vilega Rodrigues-CVR (INPE/MCT)	Principal Investigator
Damien Jones (Prime Optics)	Optical designer
Deonisio Cieslinski (INPE/MCT)	Scientist
Francisco J. Jablonski-FJJ (INPE/MCT)	Co-Principal Investigator
Gabriel Franco (UFMG)	Scientist
Joaquim E. Rezende Costa (INPE/MCT)	Scientist
José Ângelo Neri (INPE/MCT)	Control and Acquisition Design
Karleyne M. G. da Silva (INPE/MCT)	Scientist
Keith Taylor-KT	Project Manager
Luiz Antonio Reitano-LAR (INPE/MCT)	Mechanical technician
Marcelo Assafin (Obs. Valongo/UFRJ)	Scientist
Rene Laporte-RL (INPE/MCT)	Opto-mechanical Consultant
Ruben Dominguez-RD (Univ. of Arizona)	Mechanical designer
Tania Dominici-TD (LNA/MCT)	LNA representative