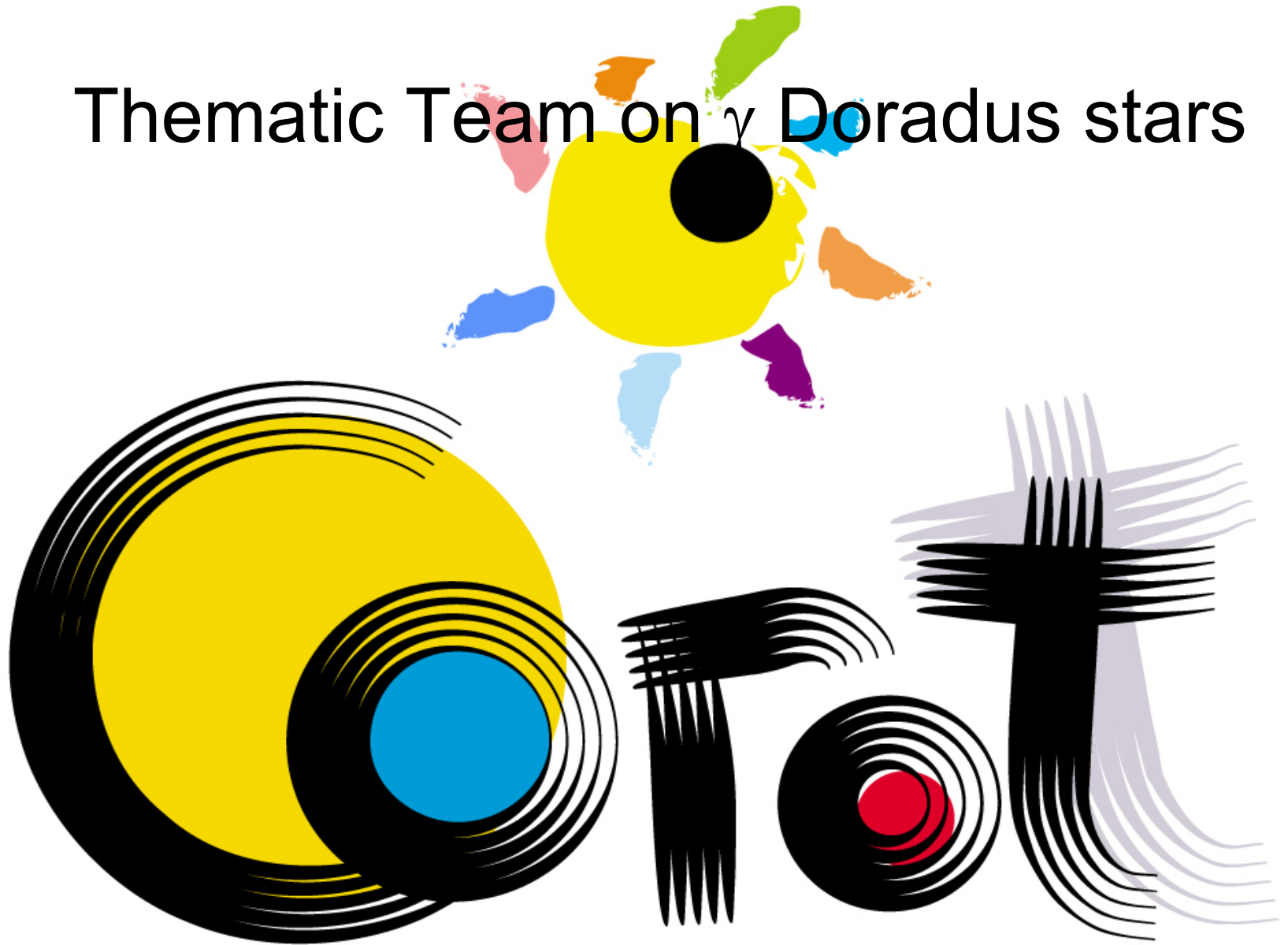


Thematic Team on γ Doradus stars



J.C. Valtier, P. Mathias



Thematic Team on γ Doradus stars

http://www.obs-nice.fr/gdor_corot/index.html

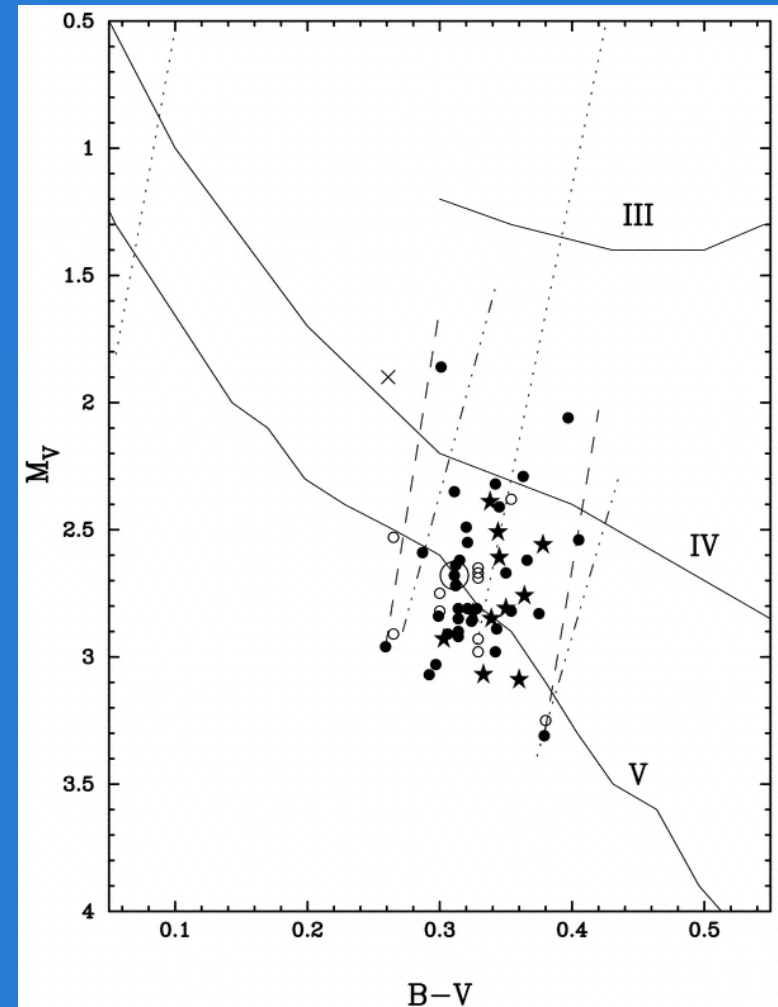
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Jean-Claude Valtier	OCA-Gemini
Werner Weiss	Vienna University



γ Doradus stars: generalities

- ▶ A7 -- F5
- ▶ V -- IV
- ▶ g-mode pulsators
- ▶ 54 confirmed variables
- ▶ Periods: 0.3 -- 3 days
- ▶ Amplitudes < 30mmag
- ▶ Multiperiodic
- ▶ Flux-blocking mechanism
- ▶ 50% in binary systems
- ▶ Solar metallicity





Goals of the Thematic Team

➔ **Characterization of γ Dor in the SISMO FoV**

- Variability: spectroscopy and photometry (timescales, LPV...)
- Mode identification (moments, FDI, photometric amplitudes...)
- Abundances
- Binarity & fundamental parameters

➔ **Simulation of γ Dor behaviour in the EXO FoV**

- Expected variables (pulsating, geometric, cataclysmic)
- Signal determination (relative photometric precision $\sim 10^{-4}$)
- Mode identification from CDC 3-colour lightcurves

Corot γ Doradus in SISMO FoV

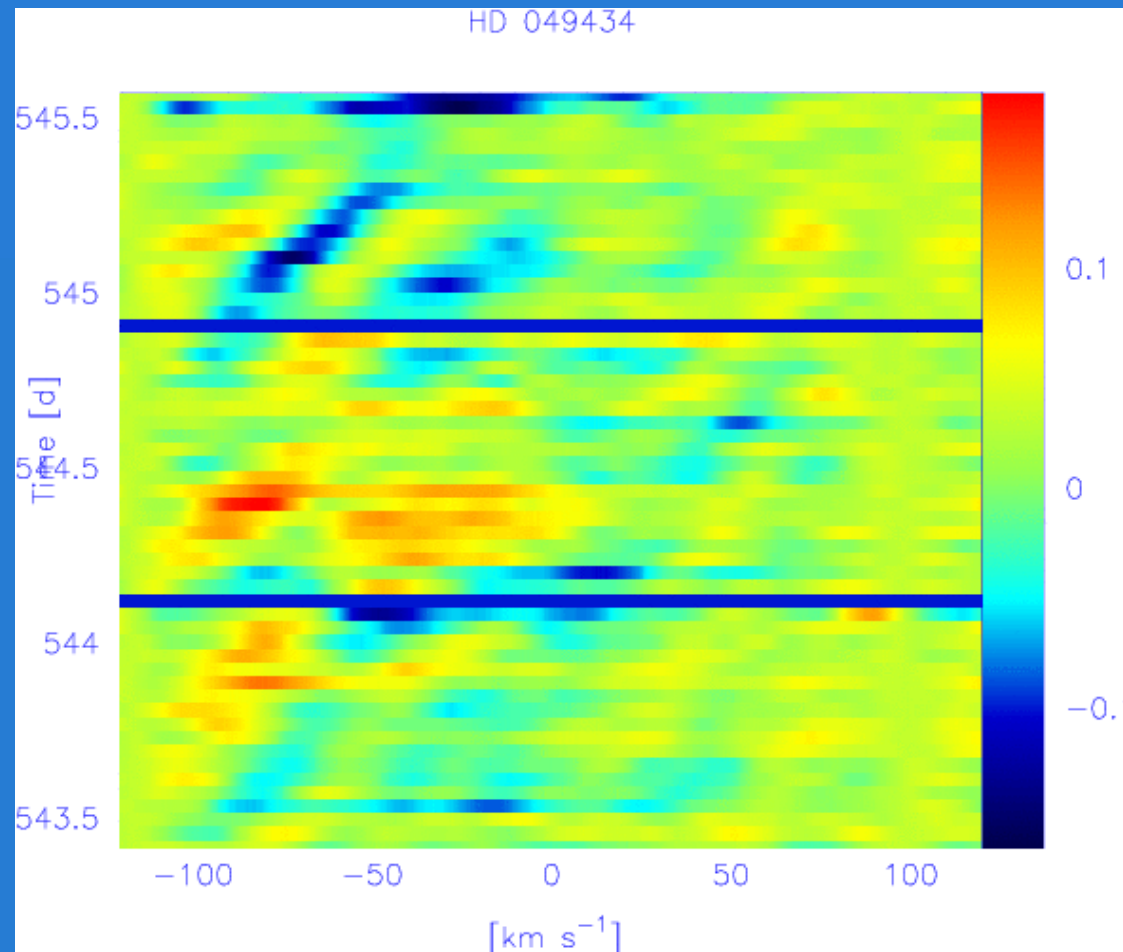
First long run (winter 2006): field of HD 49933 & HD 49434

- $v \sin i \sim 80 \text{ km s}^{-1}$
- LPV present
- No time scale determined

→ Not yet a confirmed γ Dor

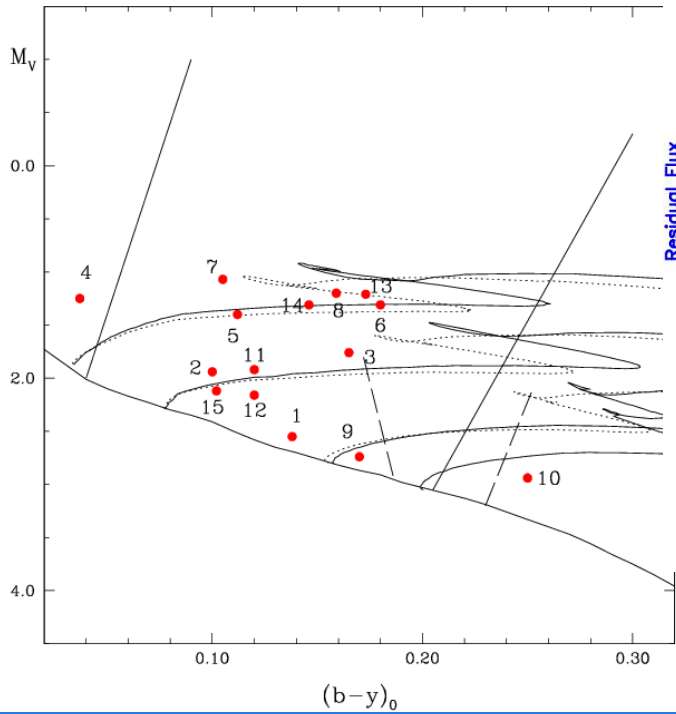


New campaign in winter 2005

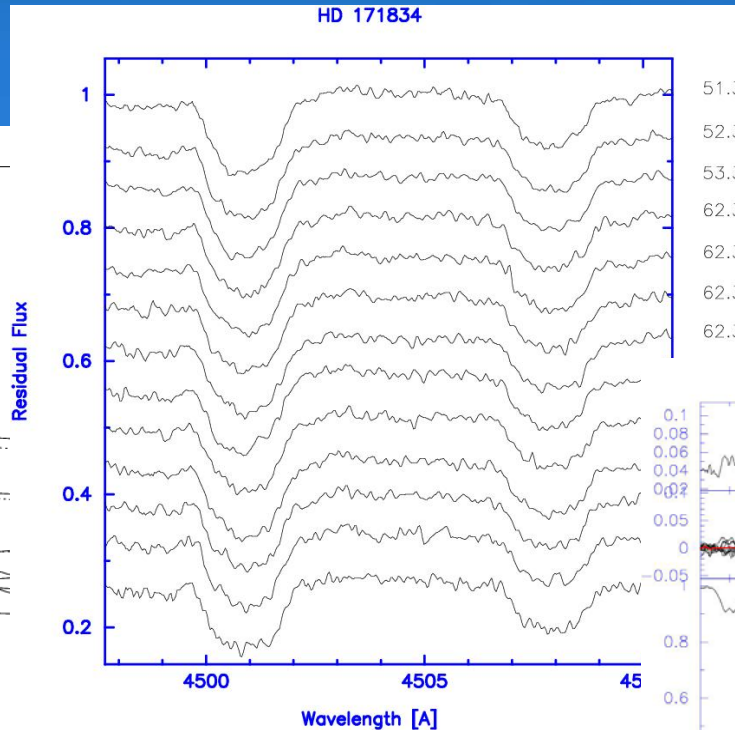




γ Dor in SISMO FoV

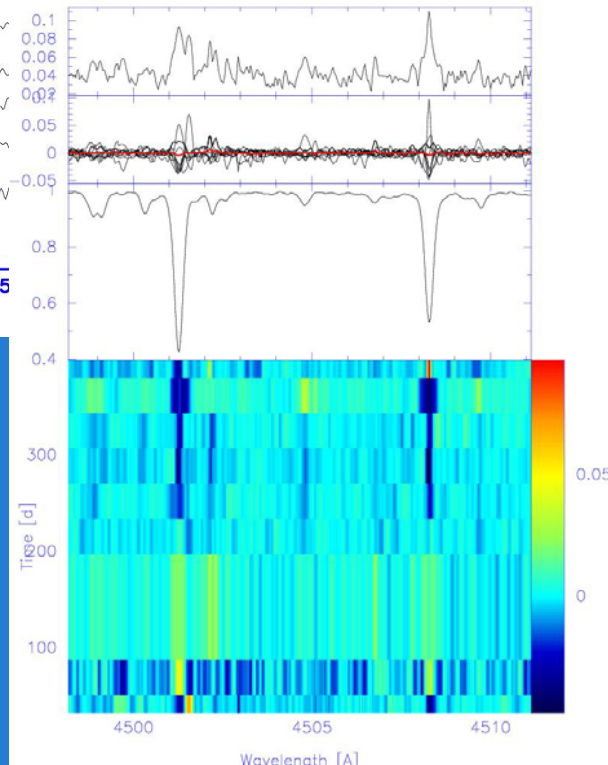


Poretti et al. 2005



51.38
52.38
53.38
62.38
62.38
62.38

HD 167858

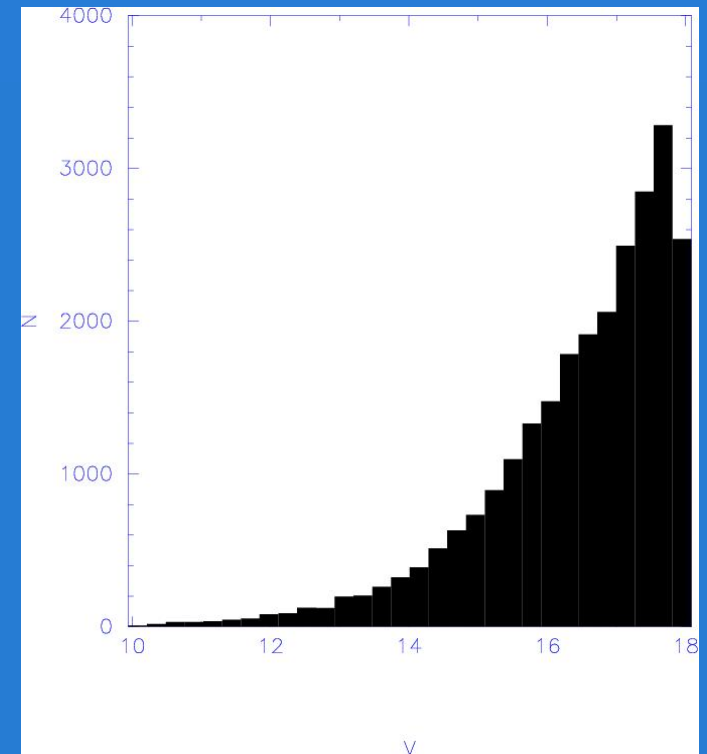
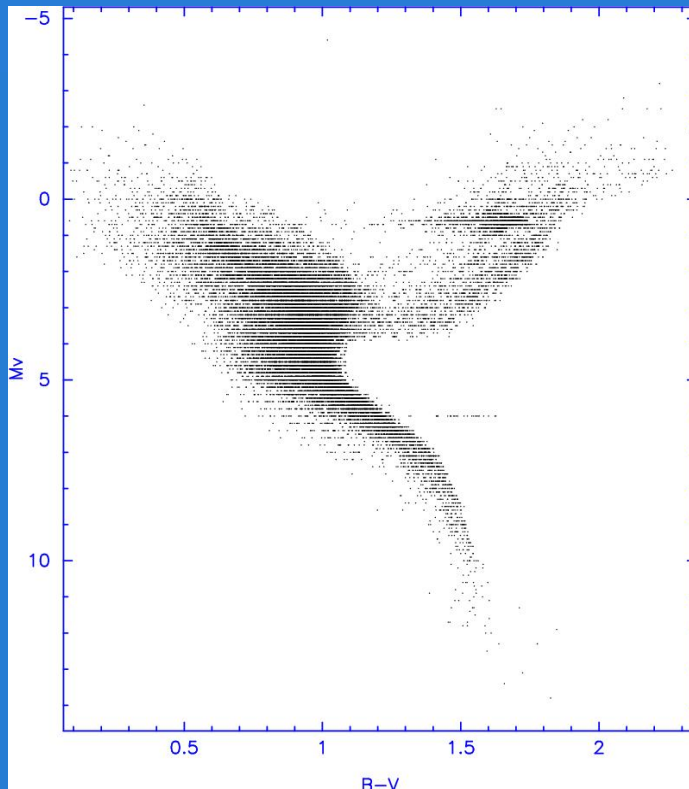


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γ Dor in EXO FoV

- No candidate known ➡ needs simulations
- Adaptation of COROTLUX (T. Guillot et al.) software for variables
- Input sample: Besançon model \sim 25000 stars

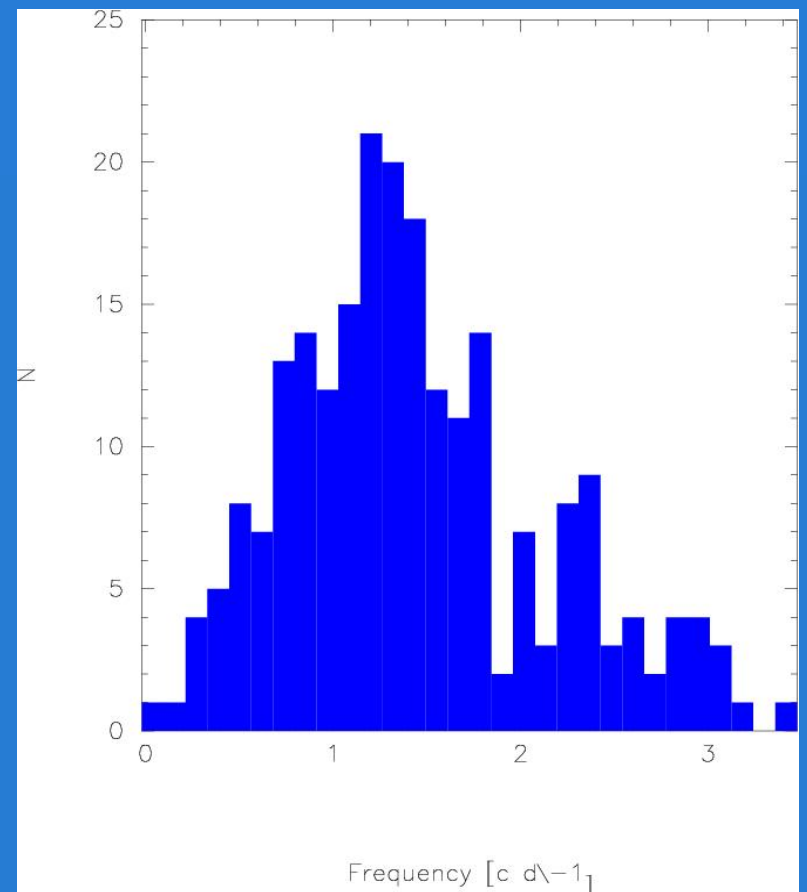
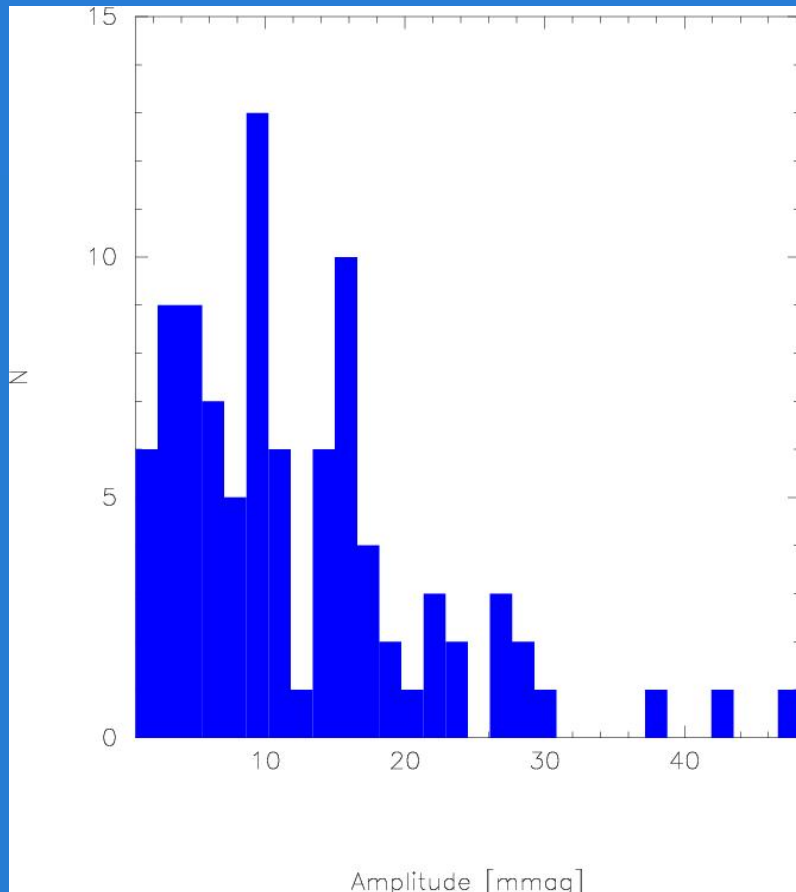




γ Dor in EXO FoV

Pulsating stars considered in EXO FoV:

β Cepheids, SPBs, δ Scuti, γ Doradus, Cepheids, Long Periods





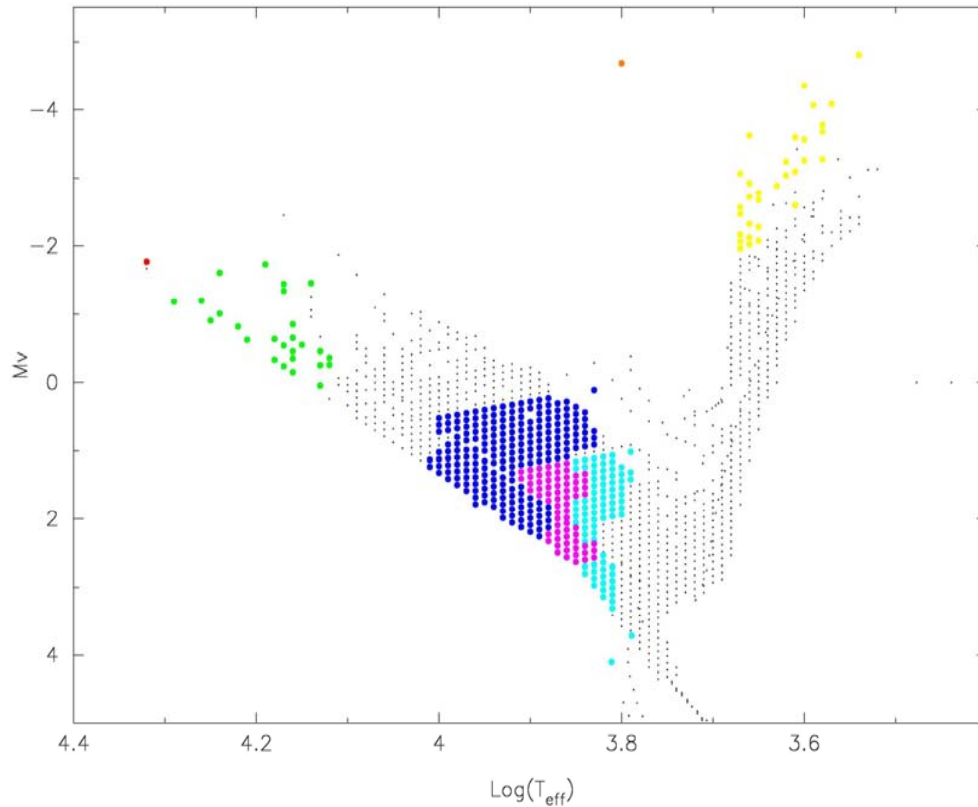
γ Dor in EXO FoV

Pulsating stars characteristics:

Class	frequencies	f [d ⁻¹]	A [mmag]
β Cepheids	[1 ; 10]	[4 - 9]	[0 ; 300]
SPBs	[1 ; 10]	[0.3 ; 3]	[0 ; 30]
δ Scuti	[1 ; 50]	[3 ; 50]	[0 ; 50]
γ Doradus	[1 ; 10]	[0.3 ; 3]	[0 ; 30]
Hybrids	[1 ; 20]	[0.3 ; 50]	[0 ; 50]
Cepheids	1	[0.01 ; 0.3]	[0 ; 1200]
Long Period	1	[0.001 ; 0.01]	[0 ; 2000]



γ Dor in EXO FoV



β Cep : 2
SPB : 29
 δ Sct : 2500
 γ Dor : 3200
Hyb : 2200
Ceph : 1
LP : 46

Fraction of variables:

➡ 30%?




General work on γ Dor

- Abundances analysis (Vienna & Mexico group): evolutionary status, metallicity
- Fundamental parameters:
 - Interferometry: binarity inclination
 - Differential interferometry:
 - ✓ Differential rotation, inclination angle
 - ✓ Stellar radius: evolutionary status
- Surveys: OHP (spectro), Mexico (photo) mainly



γ Doradus stars vs. COROT

- Any interested person is welcome to join
 contact: mathias@obs-nice.fr
- Need more and diversified data to characterize stars
- Answer the COROT **Announcement of Opportunity** before

JULY 5