SIAMOIS : a Fourier transform asteroseismometer for Dome C

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SIAMOIS

Stands in french for : Sismomètre Interférentiel A Mesurer les Oscillations des Intérieurs Stellaires

- Asteroseismology at Dôme C – scientific goals
- Concept of SIAMOIS – simulations, performances, design
- Project – organisation, schedule, budget

Asterosismology at Dome C

- Solar like oscillations

(spectral type F $\rightarrow$ K, class V and IV)

- Spectrometric signature

$\rightarrow$ Internal structure analysis

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- SIAMOIS and COROT
  - Different targets ; stellar type G and K
  - Complementary observations : spectrometry / photometry
  - Follow up of the targets identified by the secondary program of COROT

Asterosismology at Dome C

• Solar like oscillations
(spectral type F $\rightarrow$ K, class V and IV)
• Spectrometric signature

$\rightarrow$ Internal structure analysis

• Unique performances at Dome C, with better time and photometric efficiency than a network

- Possible continuous observation during several days (duty cycle $\simeq$ 100 %)
- Possible observation of an object up to 3 months (duty cycle $\rightarrow$ 80 %)
- Efficient photometry

Instrumental principle

- FT seismometry : Doppler analysis deduced from the interferogram of the stellar visible spectrum

(Mosser et al. 1998, A&A 340, 457)

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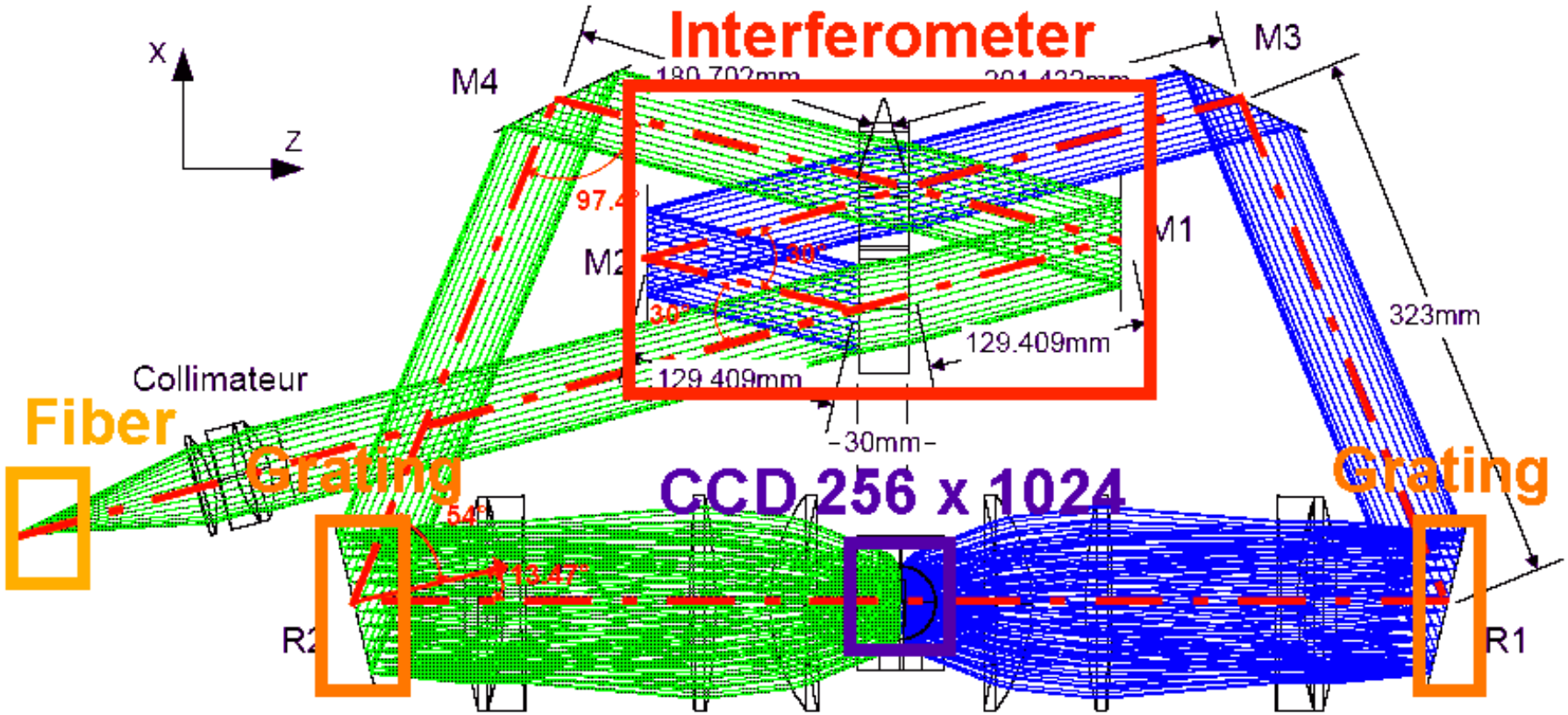
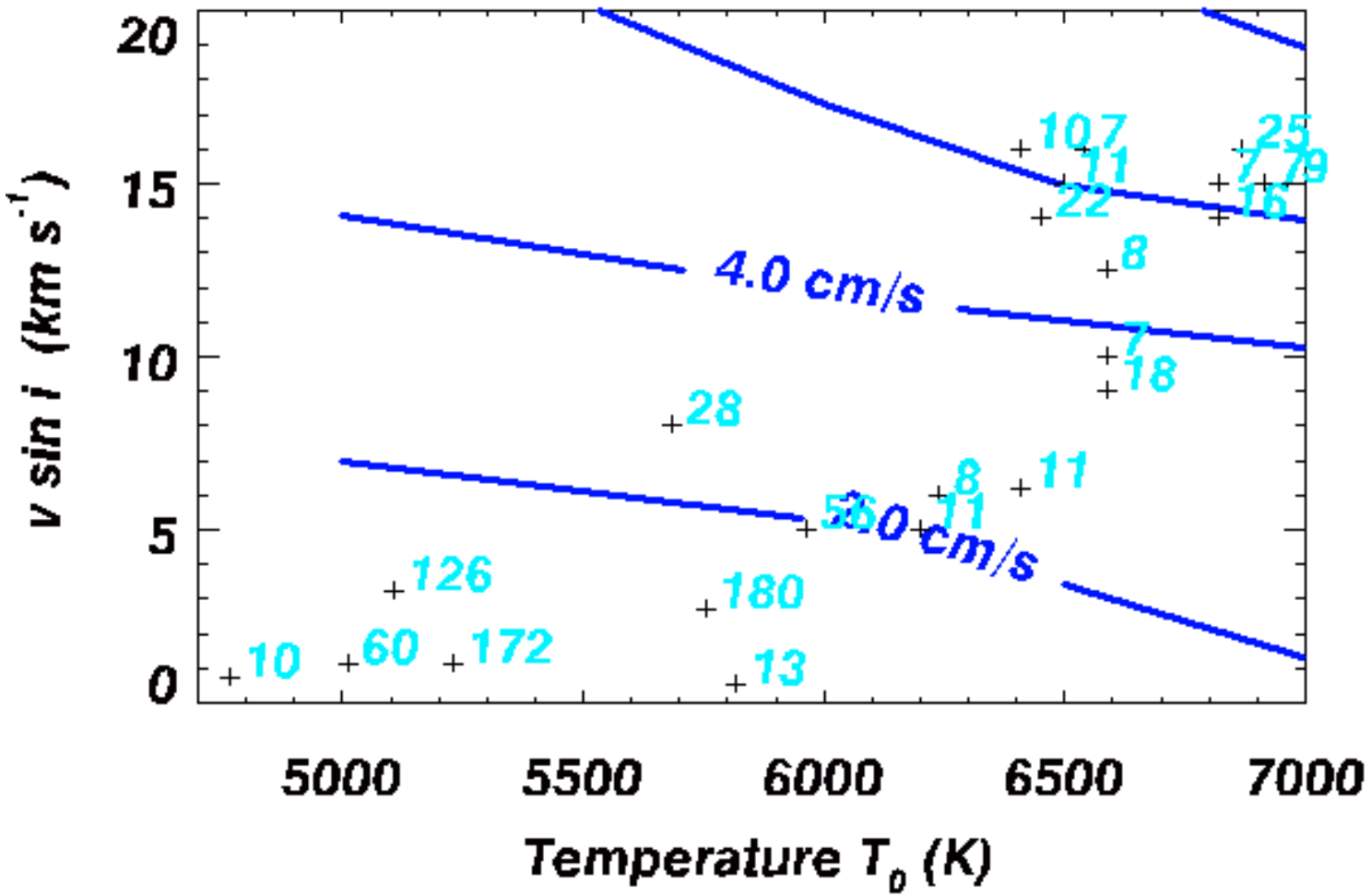
$\longrightarrow$ Instrument :

- Compact (dimensions $<$ 1 m)
- Stable (solid interferometer)
- Luminous (post-dispersion : 400 $\longrightarrow$ 560 nm spectrum)
- No moving parts (special mirror)
- Automatic (for Antarctic use)

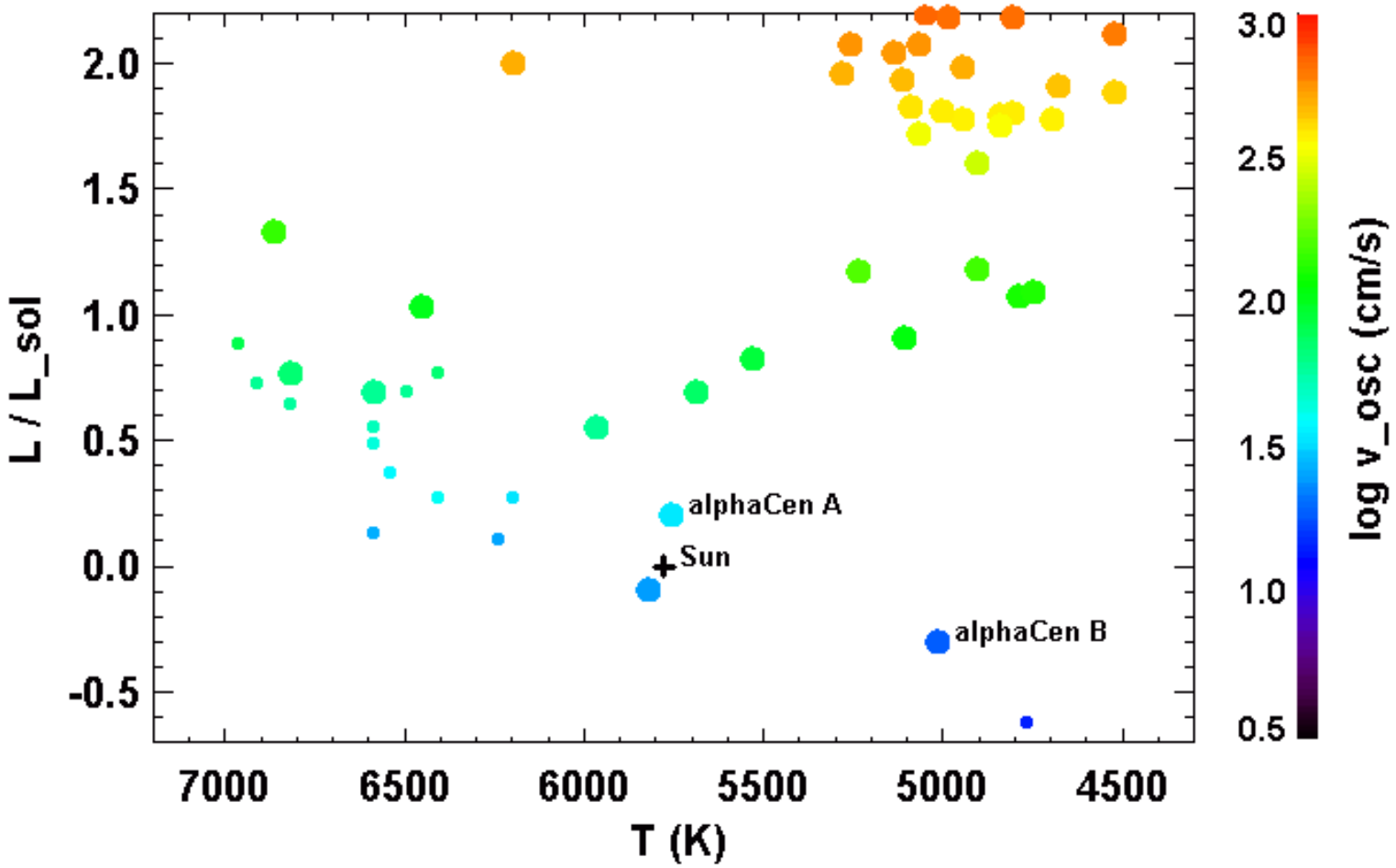
Optical design of SIAMOIS



Performances with SIAMOIS



Performances with SIAMOIS



Schedule and budget

End 2004 :

– Interferometric principle ok (Mosser et al 2003, PASP 115, 990)

– Interferometric design ok

$\longrightarrow$ 2005, 2 tasks :

– Design of the complete instrument

– Construction of the interferometer

Estimated budget $\simeq$ 400 kE

SIAMOIS

- Dome C = unique site for asteroseismology
- Asteroseismology = “big science” at Dome C with a 80-cm telescope
- SIAMOIS at Dome C : robust principle ; a rapid development is possible, participating to the construction of observations in astronomy at Dome C
- Collaborations : LESIA, GEPI, IAP, DT, IAS, OCA, UNSA, Italie, IPEV+...
- Experience of the COROT team
- FT asteroseismometry = unique solution for multi-objects spectrometric observations