



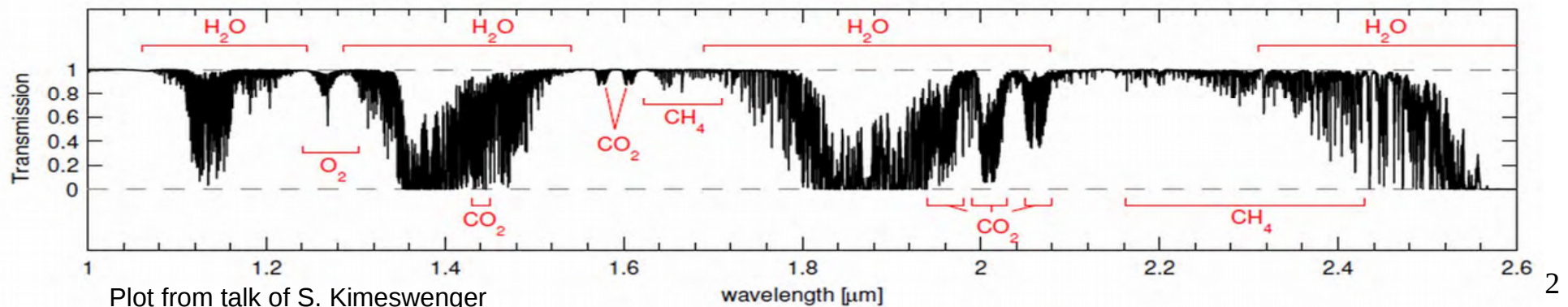
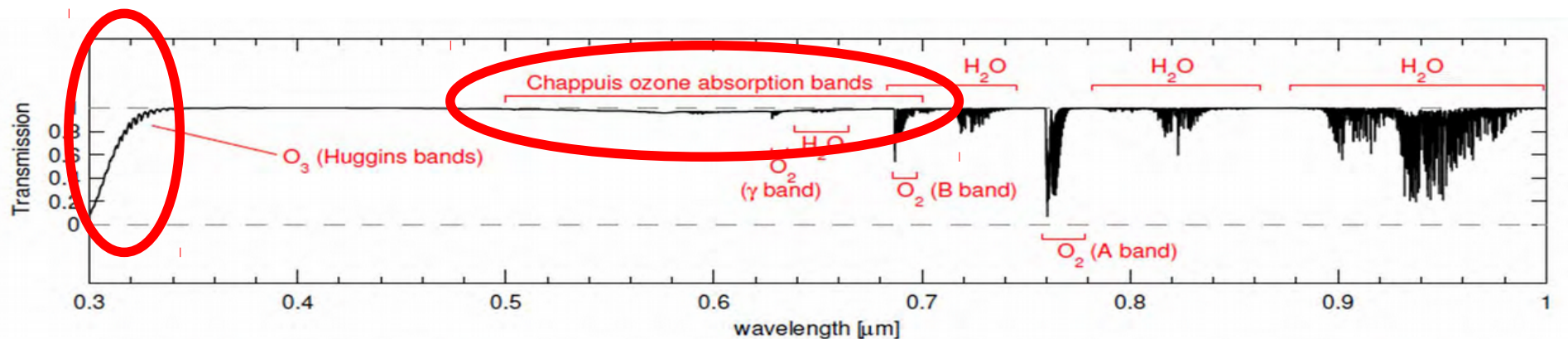
Near UV - Optical spectrograph for CTA's atmospheric monitoring

Holger Drass

S. Kimeswenger, L. Vanzi, L. Infante, A. Reisenegger

Motivation:

- The atmospheric transmission varies during CTA observation!
- ~50% in the near – UV: O₃ - Huggins bands (~300 - ~350nm).
- Up to ~6% Chappuis ozone absorption bands (~500 - ~700nm).

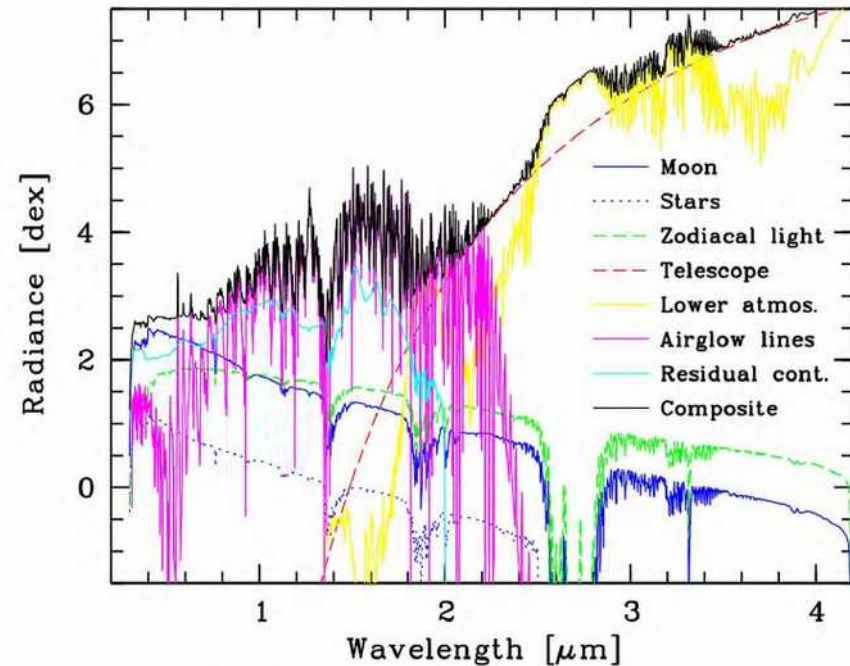


Plot from talk of S. Kimeswenger

Cerro Paranal Advanced Sky Model

MOLECFIT can do it!

For the general
idea see
S. Kimeswenger 2015



General description (optical): Noll et al. 2012, A&A, 543, A92
Scattered moonlight model: Jones et al. 2013, A&A, 560, A91

M. Lakićević and S. Kimeswenger 2016
find large differences between Armazones and Paranal

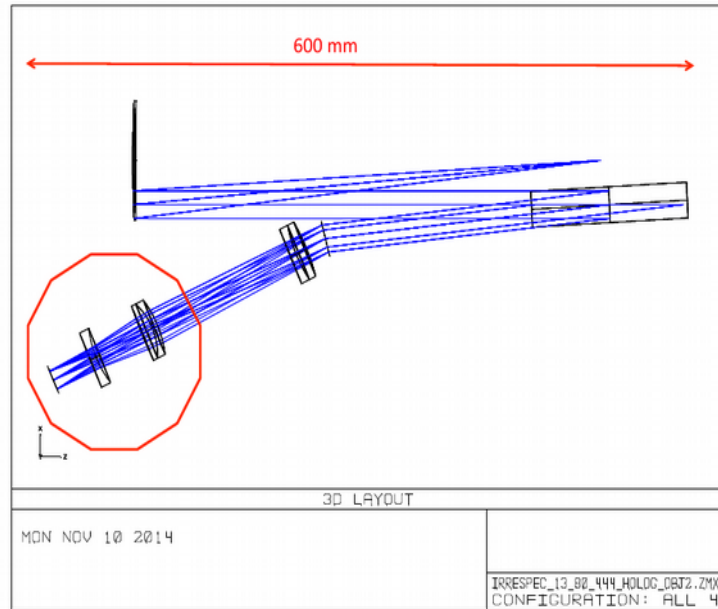
→ extreme differences in the lower atmosphere suggest
an experiment on site.

What is most needed for atmosphere observations?

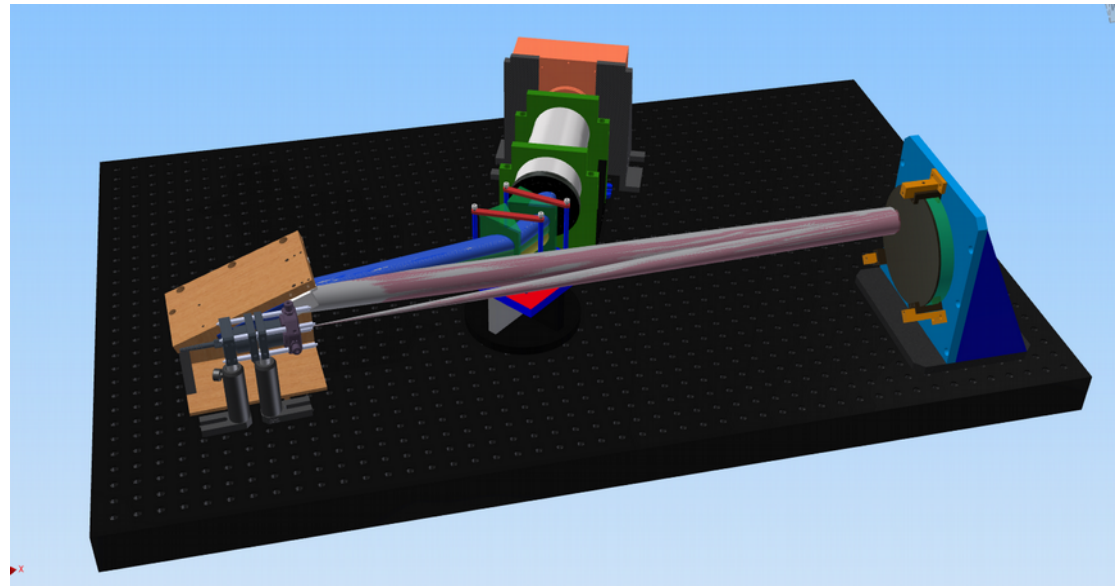
- Large spectral range: near ultraviolet → optical
- Moderate resolution

AIUC-focus: Spectroscopy

TARdYS –
near infrared

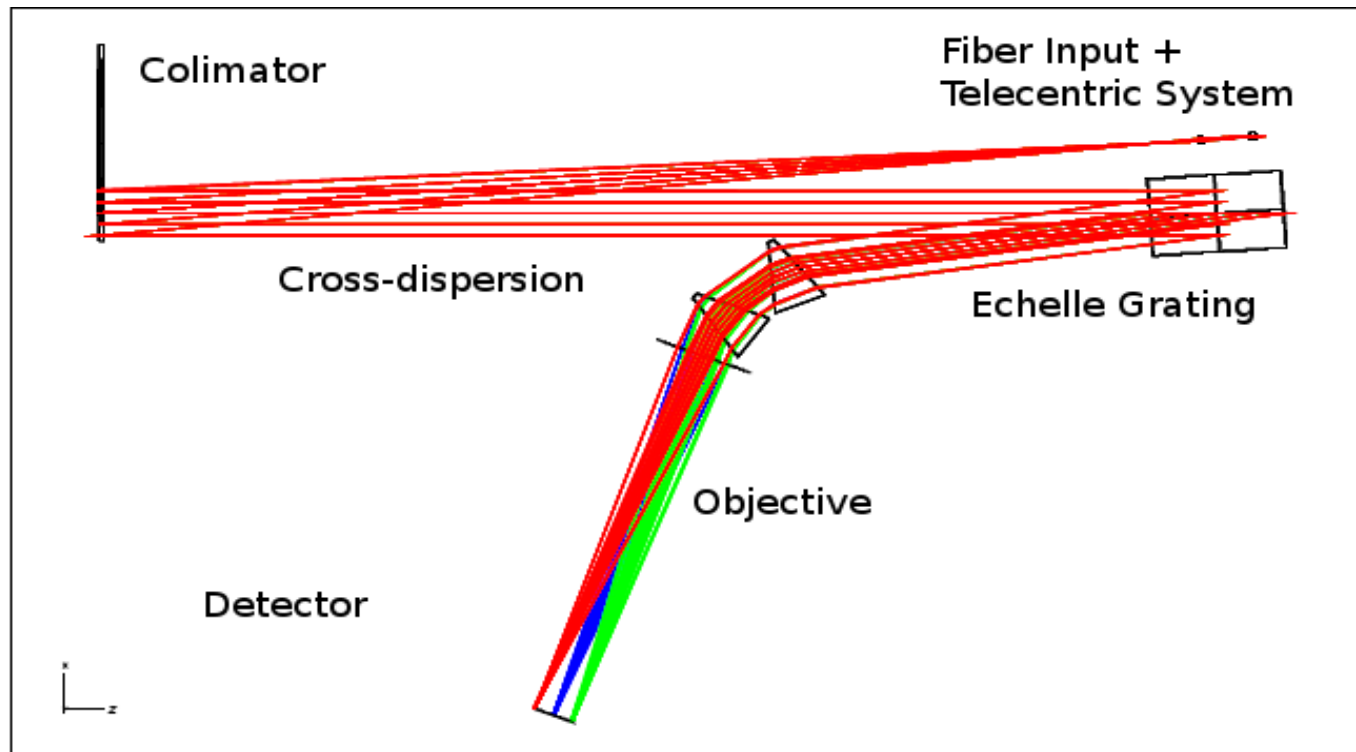


FIDEOS –
optical



Spectrograph design

Spectral resolution $\lambda/\Delta\lambda$	20.000
Spectral coverage (one shot)	~300 – ~700 nm (ultraviolet - optical)



Modified design of an existing spectrograph made at PUC (Fideos)

Schedule

Milestone	Target completion Date	Actual completion Date	Comment
First (informal) approach to funding agency	Jan 2016		
Application to funding agency	Mid 2016		Typical date of proposal call in Chile
Start of grant period	Beginning 2017		In case of approval
First item of the contribution supplied to CTA	Beginning 2019		
End of grant period / Contribution must be finished by	Beginning 2020		Might be extended

Cost estimation

WBS-Nr.	Description	# of items	Official CTA Cost Estimate per item		Own estimate (if different)		Comments
			Equipment [EUR]	Labour [FTE]	Equipment [EUR]	Labour [FTE]	
3.10.3.4.5.7	Spectrometer						
3.10.3.4.5.7.2	Prepare collaboration with An optical telescope	1			-	0.2	
-	Spectrometer						
4.10.3.4.5.7.1	Design, Selection of Material	1			3000	1	Computer software And hardware - Optical elements optimized for the ultra-violet wavelength range. - Camera sensitive in the ultra-violet. - Mechanical components - Connector to the telescope
4.10.3.4.5.7.2	Purchase of material	1			130000	0.1	
4.10.3.4.5.7.3	Construction	1			3000	2	
4.10.3.4.5.7.4	Documentation	1			-	0.5	
4.10.3.4.5.7.5	Commissioning, Tests	1			7000	1	Mainly trips to the CTA site.
4.10.3.4.5.7.6	Ship Device	1			3000	0.1	Shipping from Santiago, Chile
4.10.3.4.5.7.7	Integrate Device	1			5000	1	Mainly trips to the CTA site.
4.10.3.4.5.7.8	Transfer Device	1			2000	0.5	Mainly trips to the CTA site.
Total (single item cost x no. of each item)					156,000	6.40	

= 120 Mill CLP

Students from optical, mechanical, electrical and software engineering⁸

Funding situation

Applications in evaluation:

- Internal PUC funds
- Regional fund in Antofagasta

Thank you for your attention!

