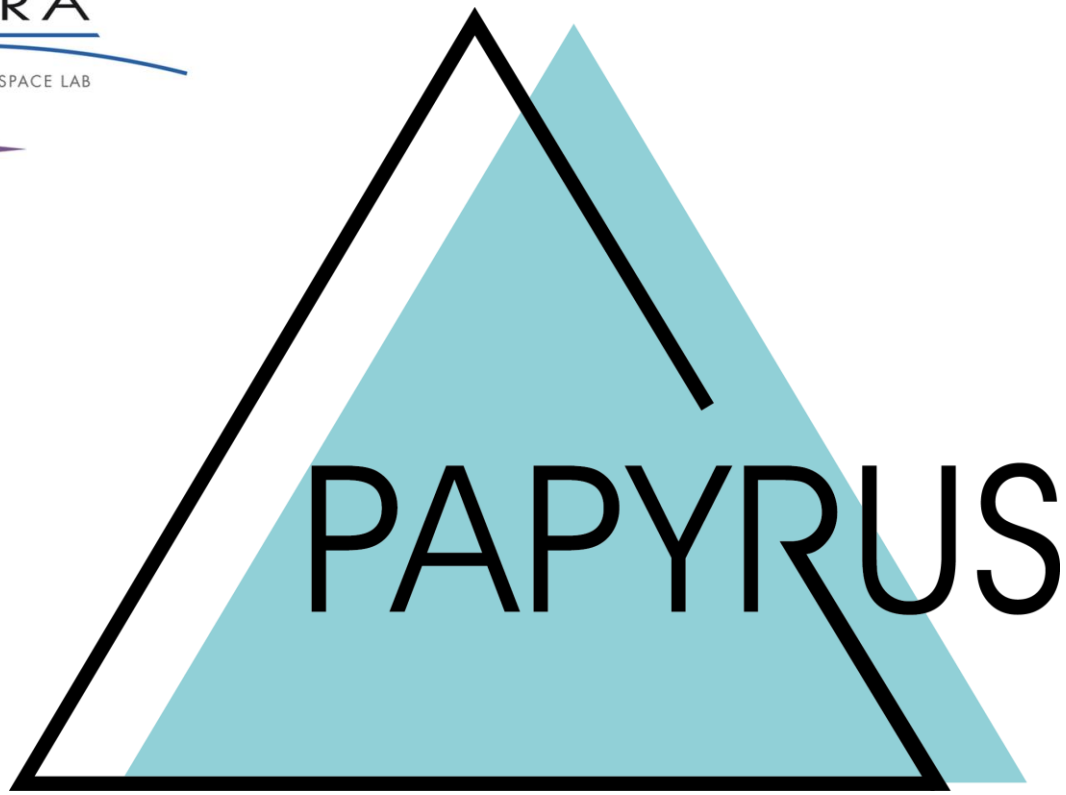
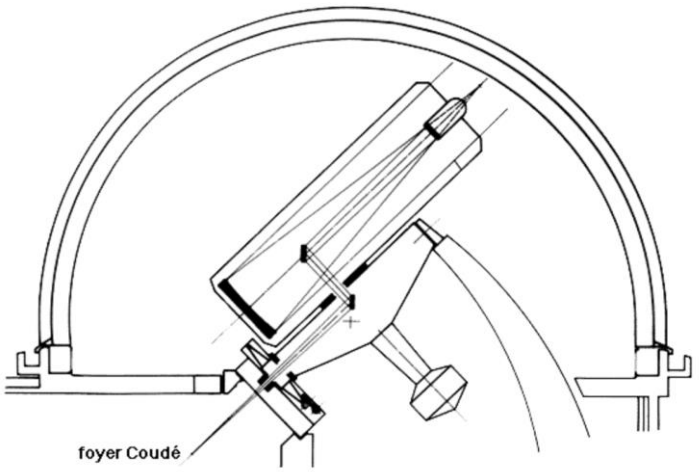


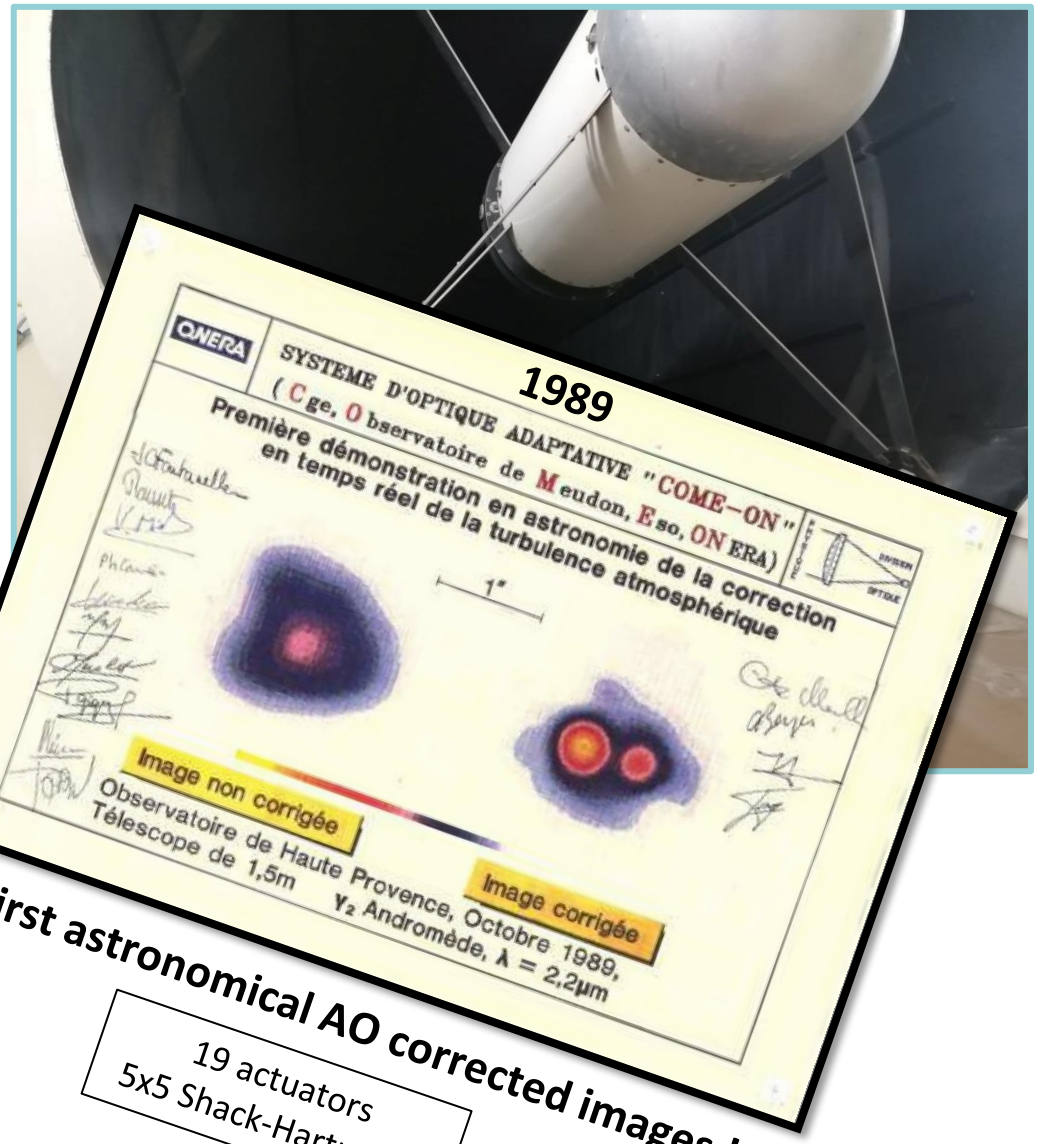
Provence **A**daptive optics **PY**ramid **RU**n **S**ystem

Kelly Joaquina, Gilles Otten, Nicolas Levraud, Mona El Morsy, Maxime Lopez, Zibo Ke, Romain Fetick, Olivier Beltramo-Martin, Vincent Chambouleyron, Eduard Muslimov, Iva Laginja, Arielle Bertrou-Cantou, Felipe Pedreros, Alexis Lau, Jérôme Schmitt, Auguste Le Van Suu, Jean-François Sauvage, Benoît Neichel, Thierry Fusco

Wavefront sensing in the VLT/ELT era V workshop – 15 Oct 2020

AO system on the T-152





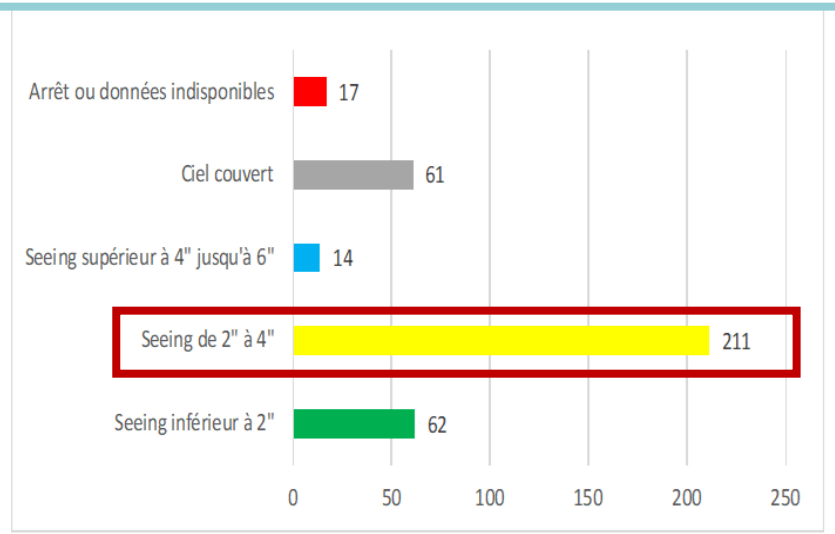
First astronomical AO corrected images !

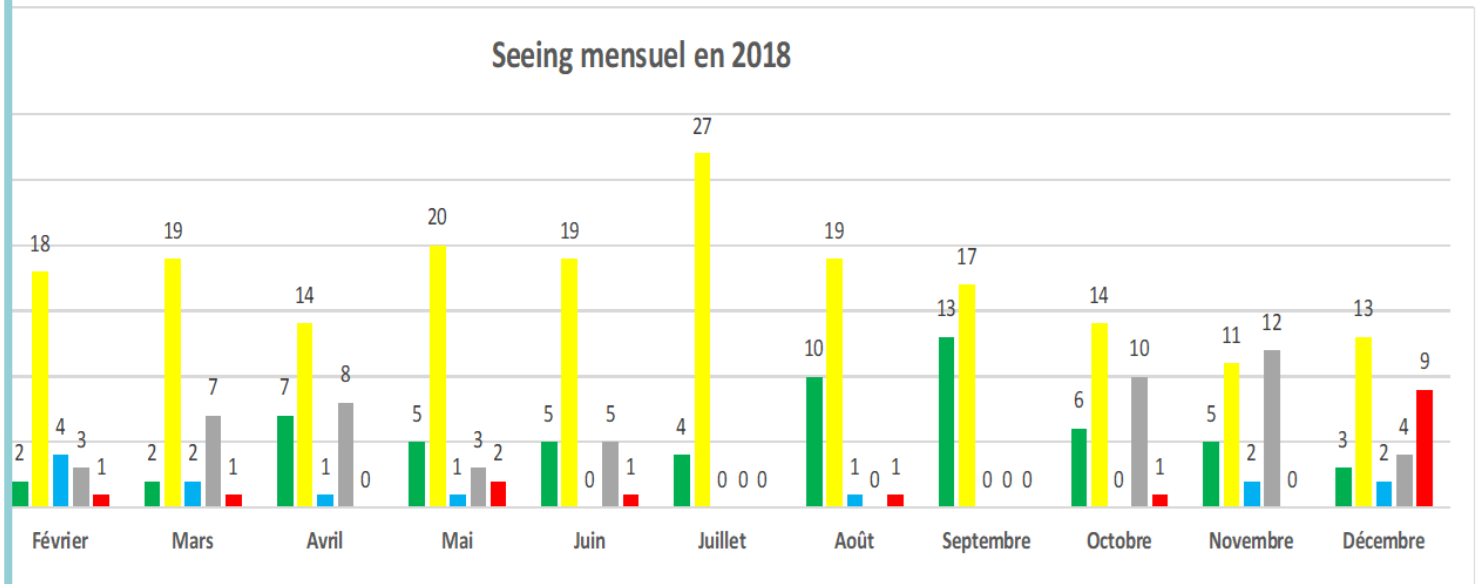
19 actuators
5x5 Shack-Hartmann

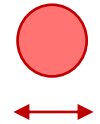
OHP Seeing statistics

	à 4"	à 4" jusqu'à 6"	Ciel couvert	données indisponibles
0	20	1	9	1
2	18	4	3	1
2	19	2	7	1
7	14	1	8	0
5	20	1	3	2
5	19	0	5	1
4	27	0	0	0
10	19	1	0	1
13	17	0	0	0
6	14	0	10	1
5	11	2	12	0
3	13	2	4	9
62	211	14	61	17

Total des nuits en 2018 : **365**







r0 = 3 - 5 cm
(550 nm)

AO system on the T-152

Goals

Teaching and Outreach

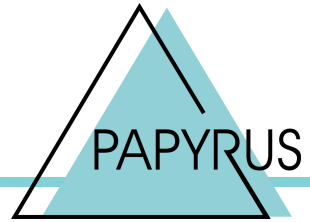
- AO system that can be used during the **Master classes and summer schools** (e.g., last week's AO school at OHP)
- Knowledge development and transfer for young researchers

Research & Development

- Use of **Pyramid** wavefront sensor control algorithms (e.g., Optical Gains, NCPA control) during on-sky tests

Scientific goals

- Access to AO corrected imaging at OHP



EXPECTED PERFORMANCE

AO Simulations

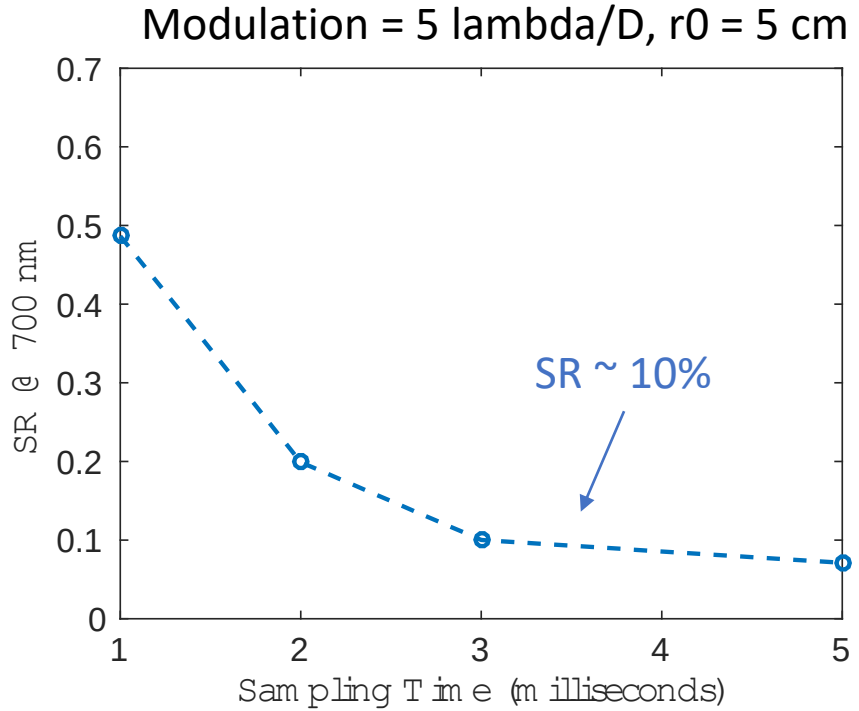
System Parameters

- D = 1.5 m
- 17x17 DM

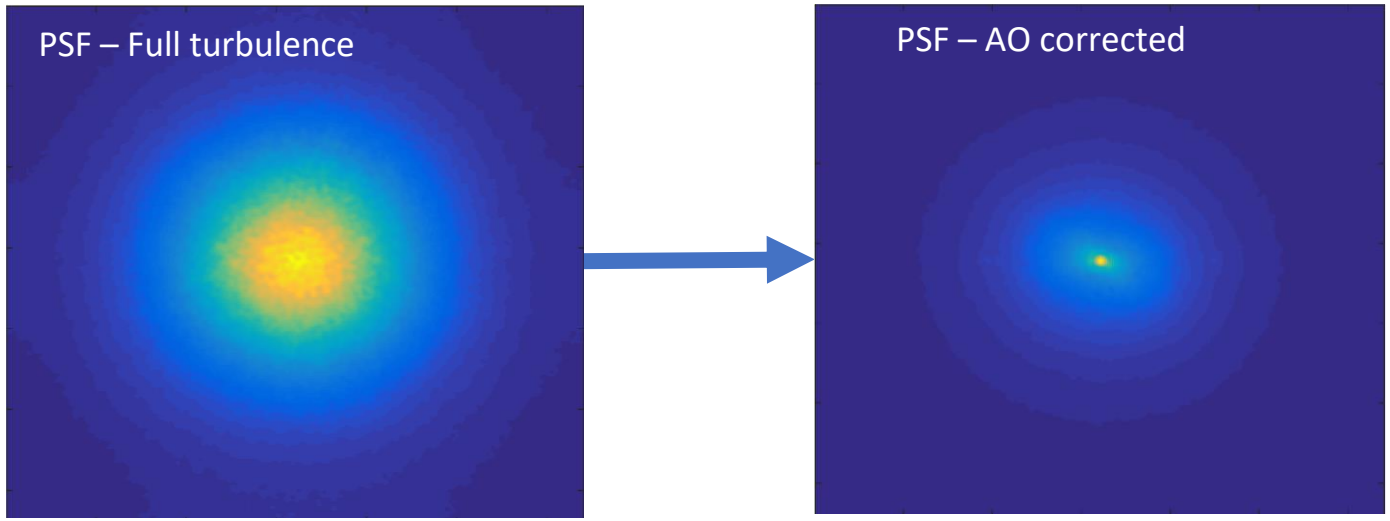
Data from RTC tests:

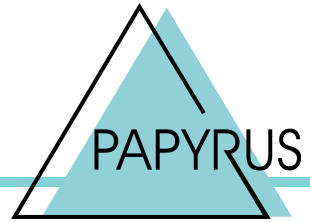
- Speed: 3.5 ms (300 Hz)
- 2.5 frames latency

Central wavelength: 700 nm



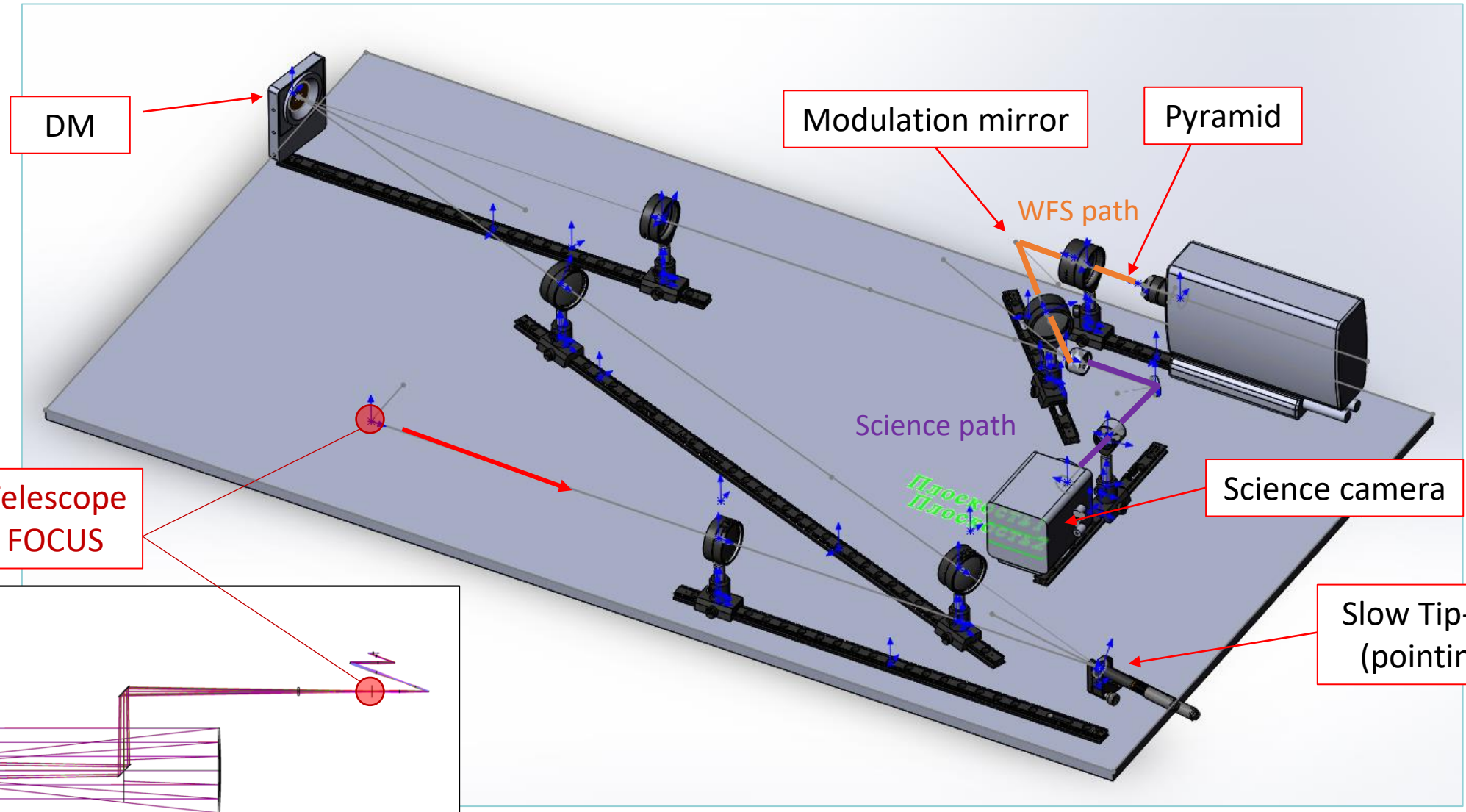
Correction speed has a big impact on performance





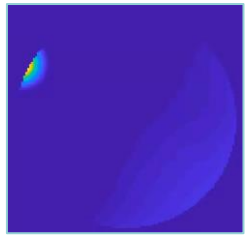
SYSTEM DESIGN

System Design



System Design

DM



17x17 ALPAO
(ONERA)

Modulation mirror

Pyramid

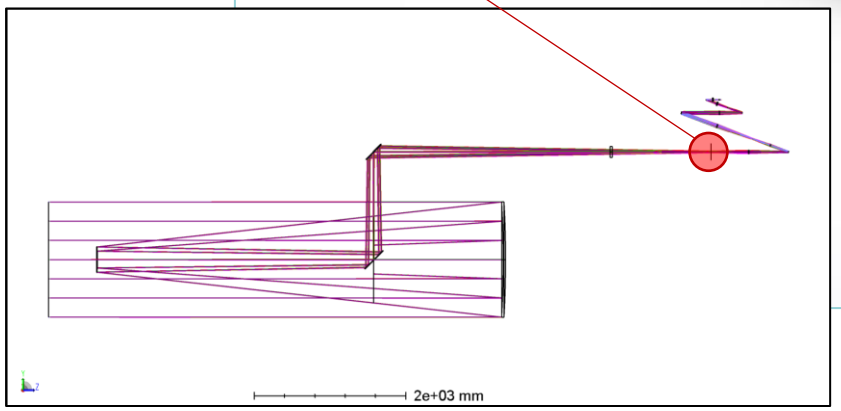
WFS path

Science path

Science camera

Telescope
FOCUS

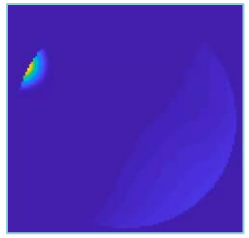
Slow Tip-Tilt mirror
(pointing mirror)



System Design

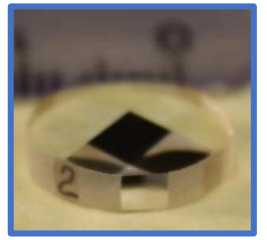
PAPYRUS

DM



17x17 ALPAO
(ONERA)

Wavefront Sensor



Glass
Pyramid

OCAM2k
FLI

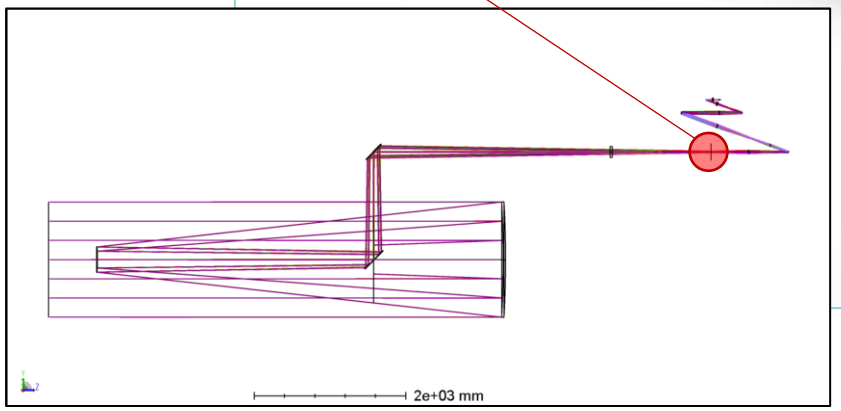
Modulation mirror

WFS path

Science path

Science camera

Telescope
FOCUS

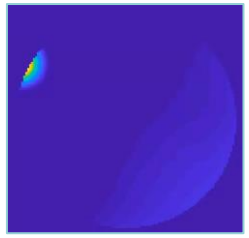


Slow Tip-Tilt mirror
(pointing mirror)

System Design

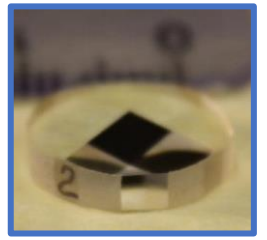
PAPYRUS

DM



17x17 ALPAO
(ONERA)

Wavefront Sensor



Glass
Pyramid

OCAM2k
FLI

Modulation mirror

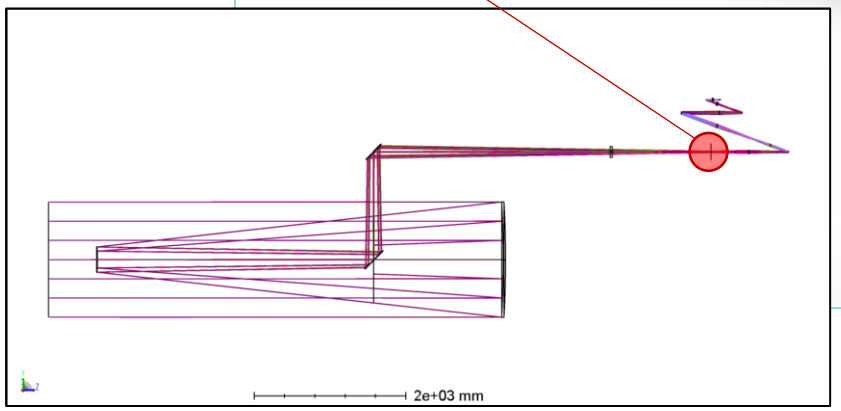
WFS path

Science path

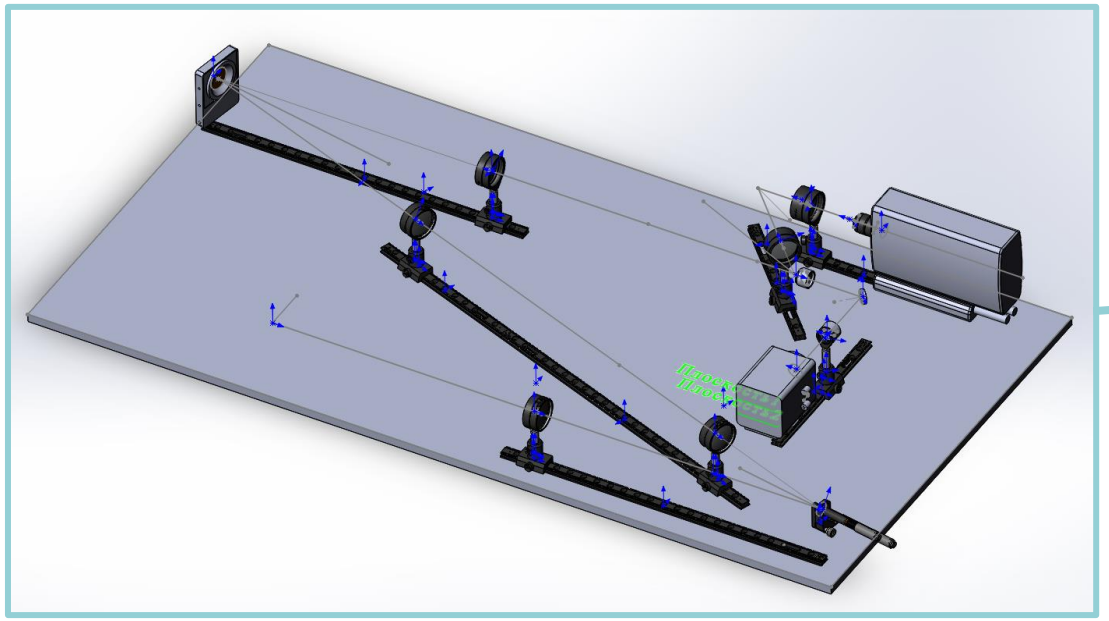
Science Cam

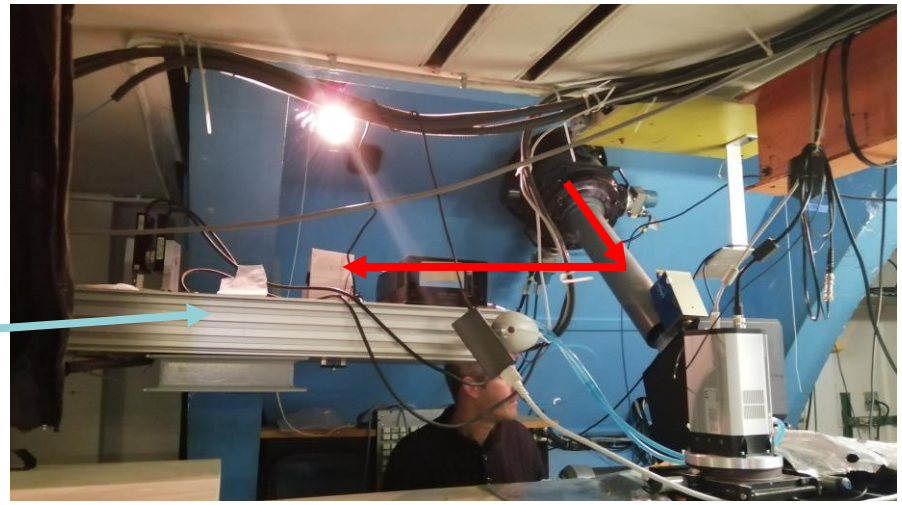
ORCA - Hamamatsu

Telescope
FOCUS



OHP

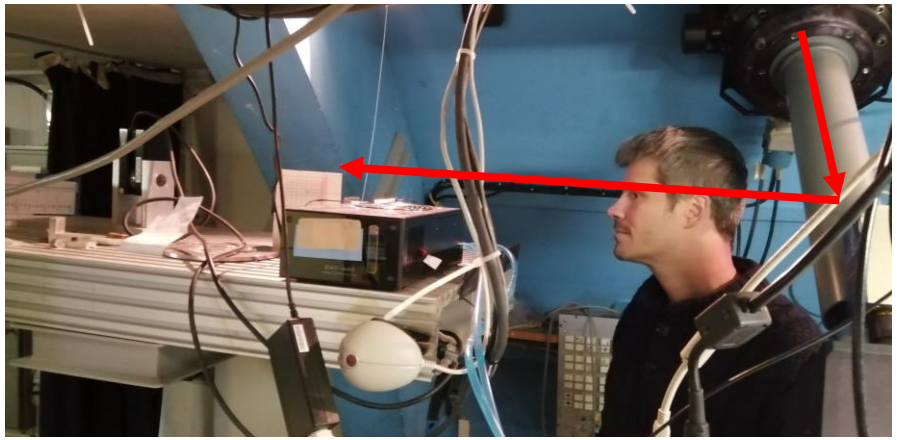


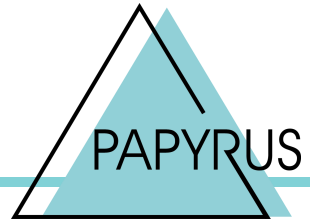


Assembly & Tests at LAM

⇩

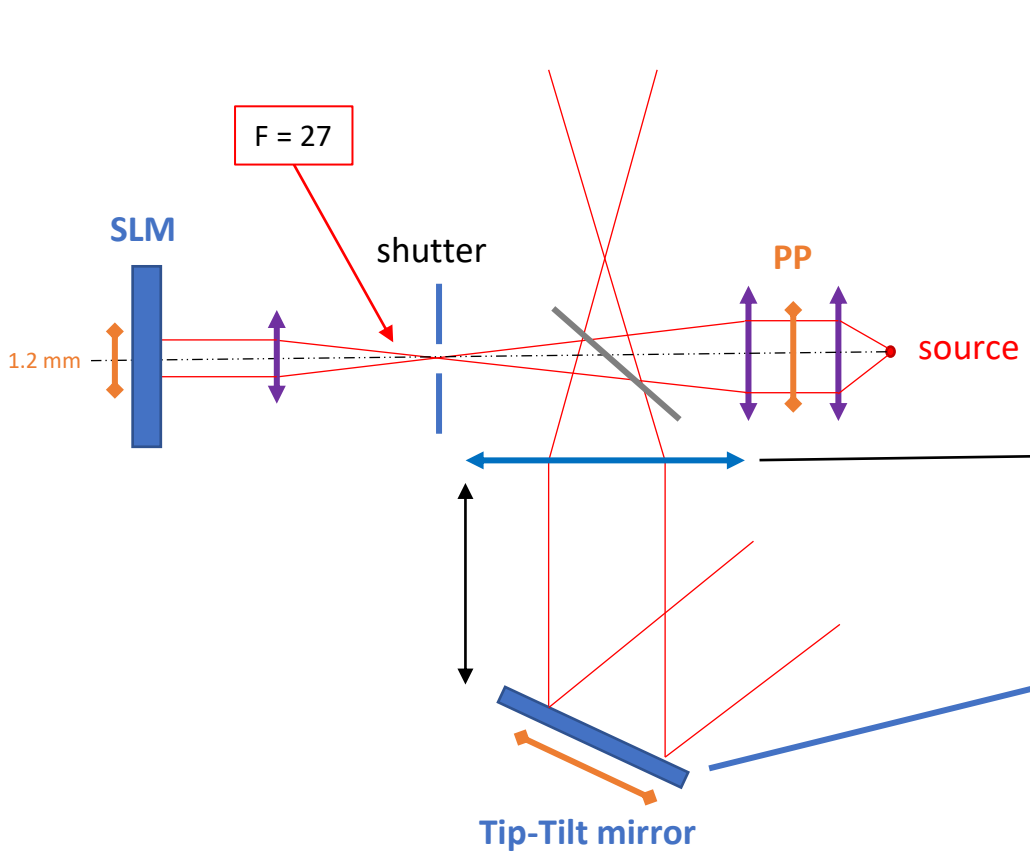
Installing PAPYRUS at OHP

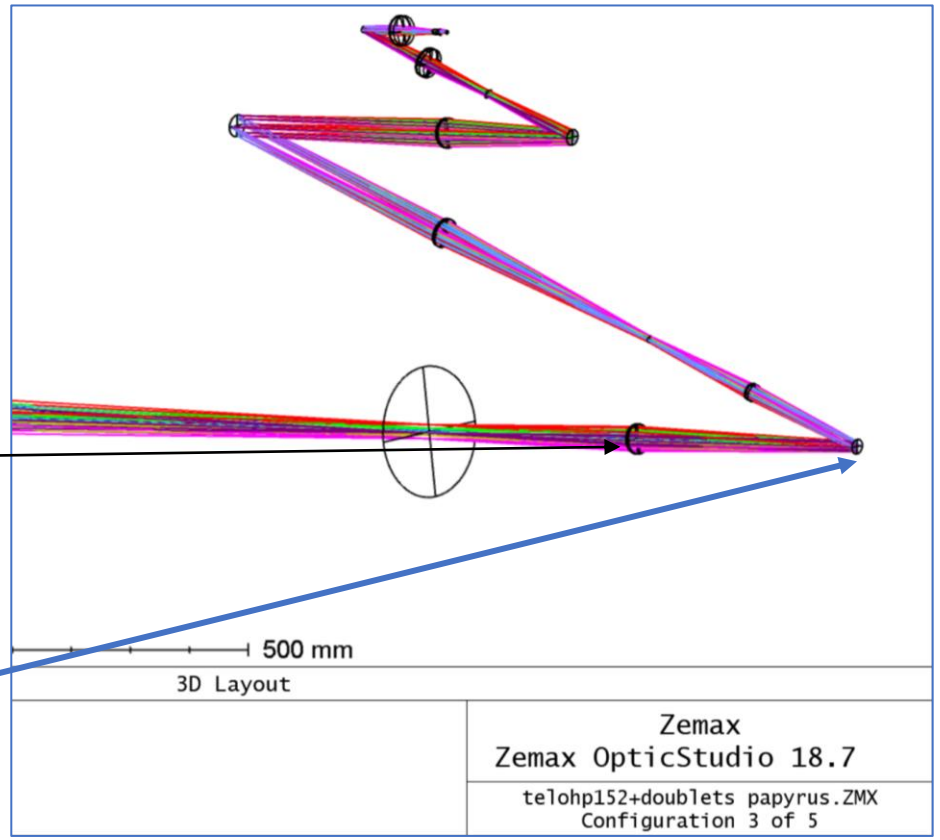




TELESCOPE SIMULATOR

Telescope simulator





Outlook

Pre-lockdown timeline: On-sky at the OHP AO summer school

Current status: Finalizing design and ordering components

By end of this year: Integration and lab tests

Early next year: On-sky tests at OHP

Thank you for your support

PAPYRUS

PAPYRUS Logo by illustrator Justine Lopez