VLT AO Community Days

Bruno Leibundgut

Background

- ESO Science Priorities
  - STC document discussed in April 2015 (STC-551)
    - AO instrument on UT4 as the next VLT instrument
    - ‘Select and design AO instrument’
  - Discussion with a group of experts
    - 15/16 September 2015
  - Paranal Science Priorities (STC-561; October 2015)
    - ’Discussion for the next AO instrument at the Nasmyth focus on UT4 to make full use of the AOF has started’
  - Planning for the next VLT AO instrument (STC-568; April 2016)
    - Presented results of the expert discussion
    - Proposed potential future development directions

Background

- STC requested community discussion
  - ‘The STC supports the initiative described in STC-568 to define a next generation AO instrument that can take advantage of the revolutionary AOF facility on UT4. We endorse the plan to hold an open meeting later this year to fully engage with the wider community in this effort.‘

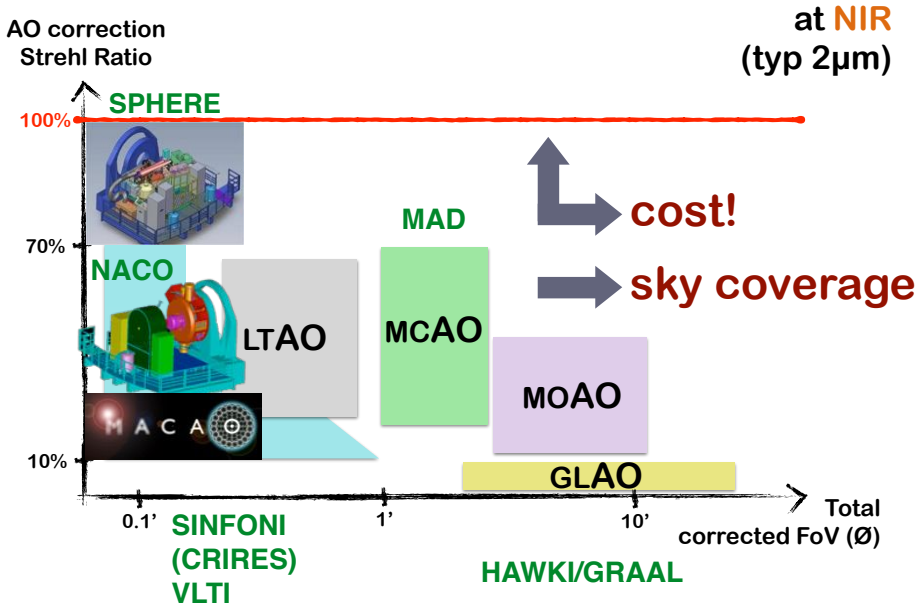
Welcome

VLT AO - Current status

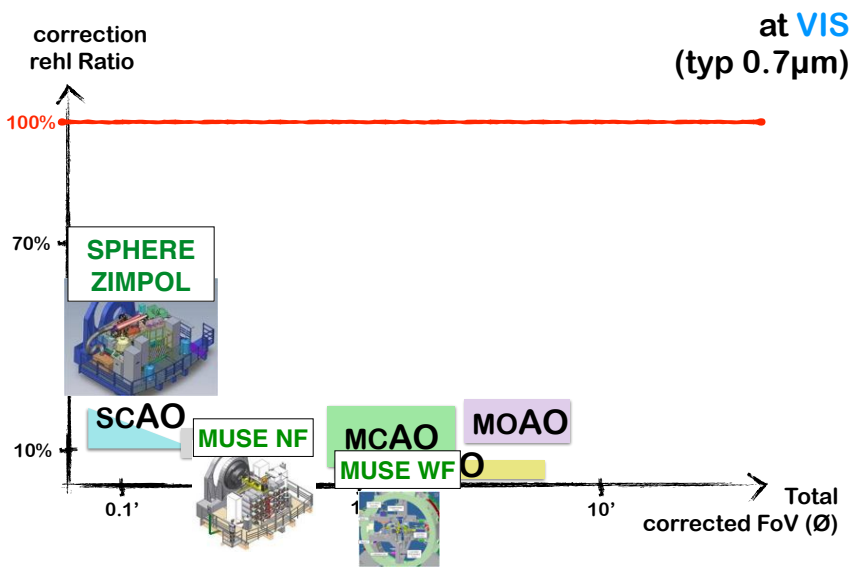
- Current VLT AO instruments cover a wide range already
  - (Julien Milli's talk for more details)
  - SPHERE - state of the art for XAO (IR and optical)
  - NACO/ERIS - SCAO with an old system – new one in the works
  - HAWK-I/GRAAL - AOF to provide IR GLAO over 7'x7'
  - MUSE/GALACSI - AOF to bring optical AO (750nm; 7"x7")
  - SINFONI/ERIS - AO support of IR integral spectroscopy
  - CRIRES+ is AO supported
  - AO for VLTI (NAOMI and CIAO)

VLT AO

Strehl ratio versus Field of View



Strehl ratio versus Field of View



Thanks to Julien Girard (ESO)

Assumptions for the discussion

- All current AO instruments to continue
- AOF commissioning in 2018
  - GLAO for HAWK-I
  - MUSE narrow-field mode
- CRIRES to return in 2018
- NACO available until mid-2019
- ERIS will be working in ~2020

VLT Instrument Planning

- Next instrument to start in 2017

Yr	Phase A	Design & Constr.	Delivered
2013		CRIRES+ MOONS	MUSE
2014	NTT Call for Ideas	4MOST	SPHERE PRIMA Astrometry (discontinued)
2015		NIRPS (New I)	LFC for HARPS VLTI PR1 GRAVITY BCI
2016		SOXS (New I)	GRAVITY CIAO VISIR Upgrade VLTI PR4 NACO ESPRESSO
2017	New II (for UT4)	CUBES(?)	MATISSE CRIRES+
2018	New III	New II (for UT4)	AOF VLTI PR3 & PR5 SOXS&NIRPS(?)
2019	New IV	New III	MOONS
2020	New V	New IV	ERIS CUBES(?) 4MOST
2021	New VI	New V	

From the Paranal Instrumentation Programme Plan 2016-2021
(Cou-1656; April 2016)

VLT Instrument Planning

- Next instrument fully financed within the current plan
- Development and construction should be around 6 to 7 years
  - start operations around 2024
- General agreement that this should be the AO instrument for UT4

VLT - considerations

- Optical/UV
  - we will lose HST in the next decade
  - Euclid (1.2m telescope)?
- VLT combines several instruments
  - flexibility
  - versatility
- AOF – DSM designed with a high density of actuators
  - MUSE NFM as driver
  - 4 lasers excellent for required field corrections
  - unique among current 8m telescopes

VLT AO Community Days

Day 1, 20 September (aftern			Day 2, 21 September		
12:00		**Registration**	09:00	R. Ragazzoni	Future directions for AO
13:00	B. Leibundgut	**Introduction**	09:30	G. Bono	Science with Optical MCAO
13:15	J. Milli	Current VLT AO	09:50	P. Hibon	Optical MCAO with Gemini
13:40	M. Lelouarn	AO simulations	10:00	F. Zamkotsian	AO-supported MOS
14:00	J.-L. Beuzit	SPHERE Science/ XAO	10:20	B. Neichel	Science with IR MCAO
14:20	R. Davis	ERIS Science	10:30	R. Sharples	Science with MOAO
14:40	H. Kuntschner	HAWK-I/ GLAO Science	10:50	R. Schoedel	Time domain and SED in the Galactic Centre
15:00	J. Vernet	MUSE Science/ optical AO	11:00		**Coffee Break**
15:20		**Coffee Break**	11:15	M. Kasper	Science with XAO
15:45	F. Rigault	MCAO/ GEMS	11:35	M. Goto	LGS-supported high-resolution spectroscopy
16:05	T. Morris	MOAO	11:45	J.-U. Pott	Extending AO capabilities of existing telescopes
16:25	S. Esposito	Optical MCAO	11:55		**Discussion**
16:45	J.-F. Sauvage	XAO	13:30		**End of meeting/ lunch**
17:05		**Discussion**			
18:00		**Beer and Brezn**			