

Simulation Software for MCAO on ELT's

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Simulation	Goal	Language	Interface	Diffraction	Parallelized	Availability	Documentation
Zemax	Optics	C	GUI	Far	No	Proprietary	Web
MACOS	Optics	Fortran	Shell	Near/Far	No	Proprietary	Prsnl comm
Beam Warrior	Optics	?	?	Near/Far	?	Proprietary	Literature
GLAD	Optics	?	?	Near/Far	?	Proprietary	Manual
Light Pipes	Optics	C, Matlab	Shell	Near/Far	No	Free	Web
See	Scidar	?	?	Near/Far	No	Not avail.	Web
Wave Train	SCAO	C++	GUI	?	?	Free license	Web
TASAT	SCAO	?	?	?	?	Proprietary	Web
ESO	SCAO	IDL	GUI	Far	No	Not avail.	Web
F. Rigaut	SCAO	IDL	Shell	?	No	Free	Web
TOSC	SCAO	OO Matlab	GUI	?	No	Proprietary	Web
Keck sim	SCAO	4 languages	?	?	No	Not avail.	None
Keck sim II	MCAO	C	Single app	Far	Yes	Not avail.	None
Lockheed	MCAO	Matlab	?	?	?	Proprietary	None
Ellerbroek	MCAO	Ratfor/Matlab	Single app	Far	Yes	Not avail.	Literature
Le Louarn	MCAO	IDL/C	?	Far	Yes	Not avail.	Literature
Arroyo	MCAO	C++	Library	Near/Far	Yes	Free	Web

Code Reuse for MCAO ELT Simulations

It is difficult to contemplate extending existing SCAO simulations to cover the MCAO case.

The two efforts that have done so required low level redesigns.

Possible Simulation Applications

Scidar

Generalized seeing monitors

Scientific instrumentation

Data reduction algorithms

Effects of environmental influences

Diagnosis of AO system performance problems

Reconstructor testbed

Wavefront sensor testbed

GSMT segment phasing and active control

Phase diversity

ExAO system performance analysis

MCAO system performance analysis

Optical/IR interferometry

An Open Source Model

Development is leveraged over many applications

Users provides feedback, resulting in better code

Users may wish to contribute to development

Large user base ensures future support

Arroyo's Design Features

Underlying functionality in a library

Extensibility via class derivation

Parallelizability

Portability across UNIX hardware platforms

Nonproprietary code

No higher level languages

Documentation and example programs

Arroyo's User Base

Rich Dekany: coronography

Mitch Troy: idealized modal compensation

A number of other expressions of interest...

<http://eraserhead.caltech.edu>