End-to-end AO modeling with the Software Package CAOS -1

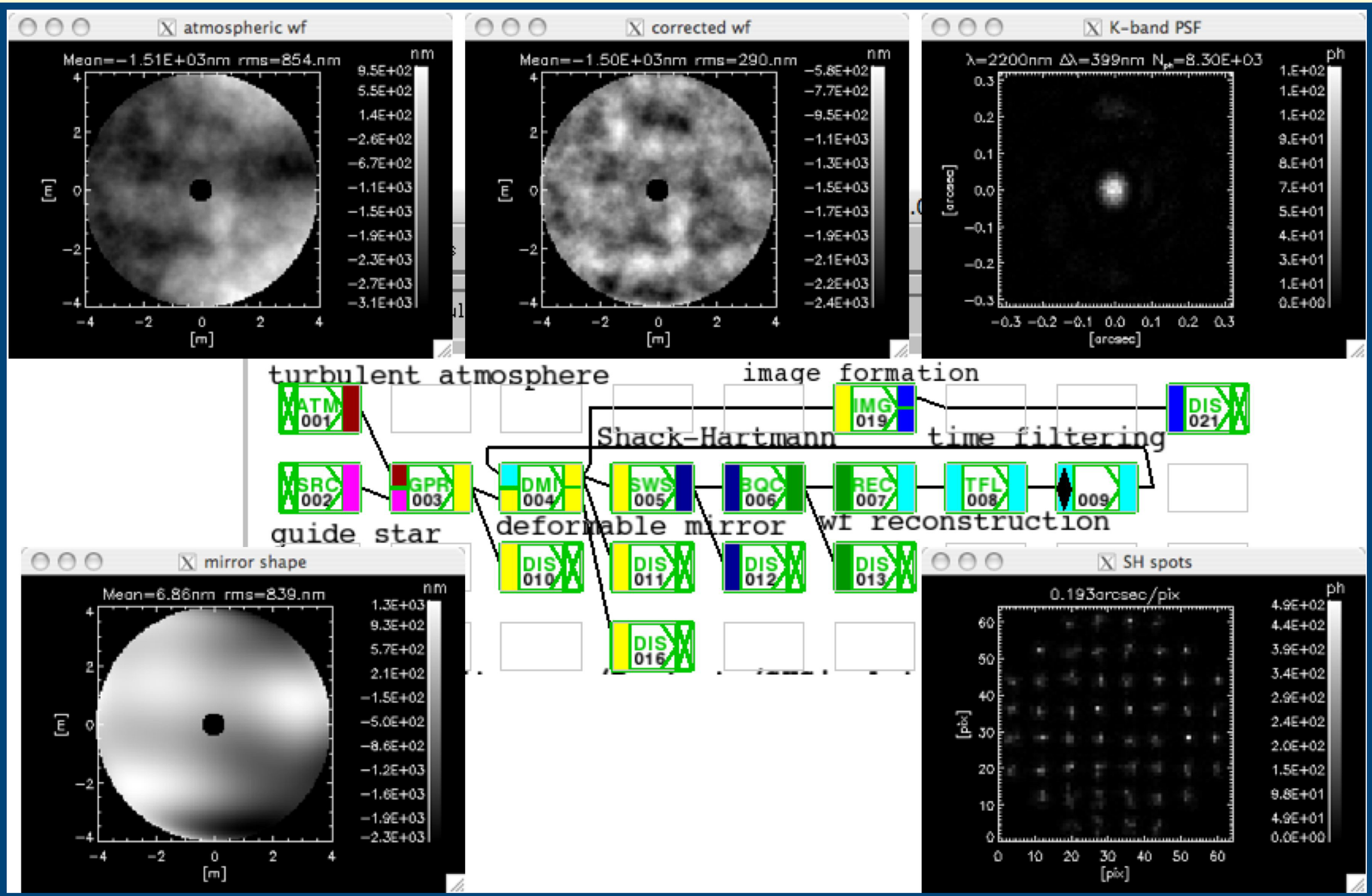
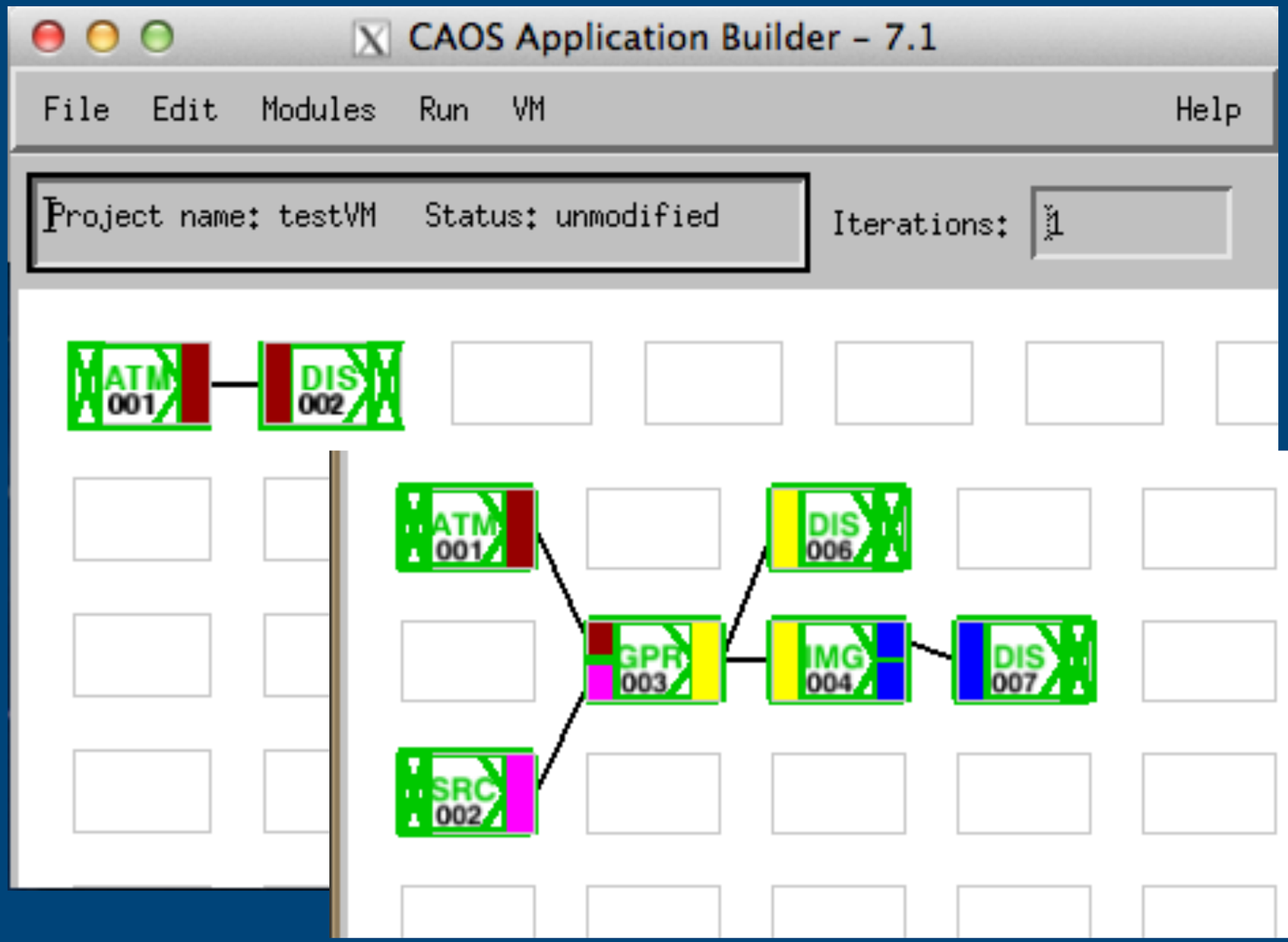


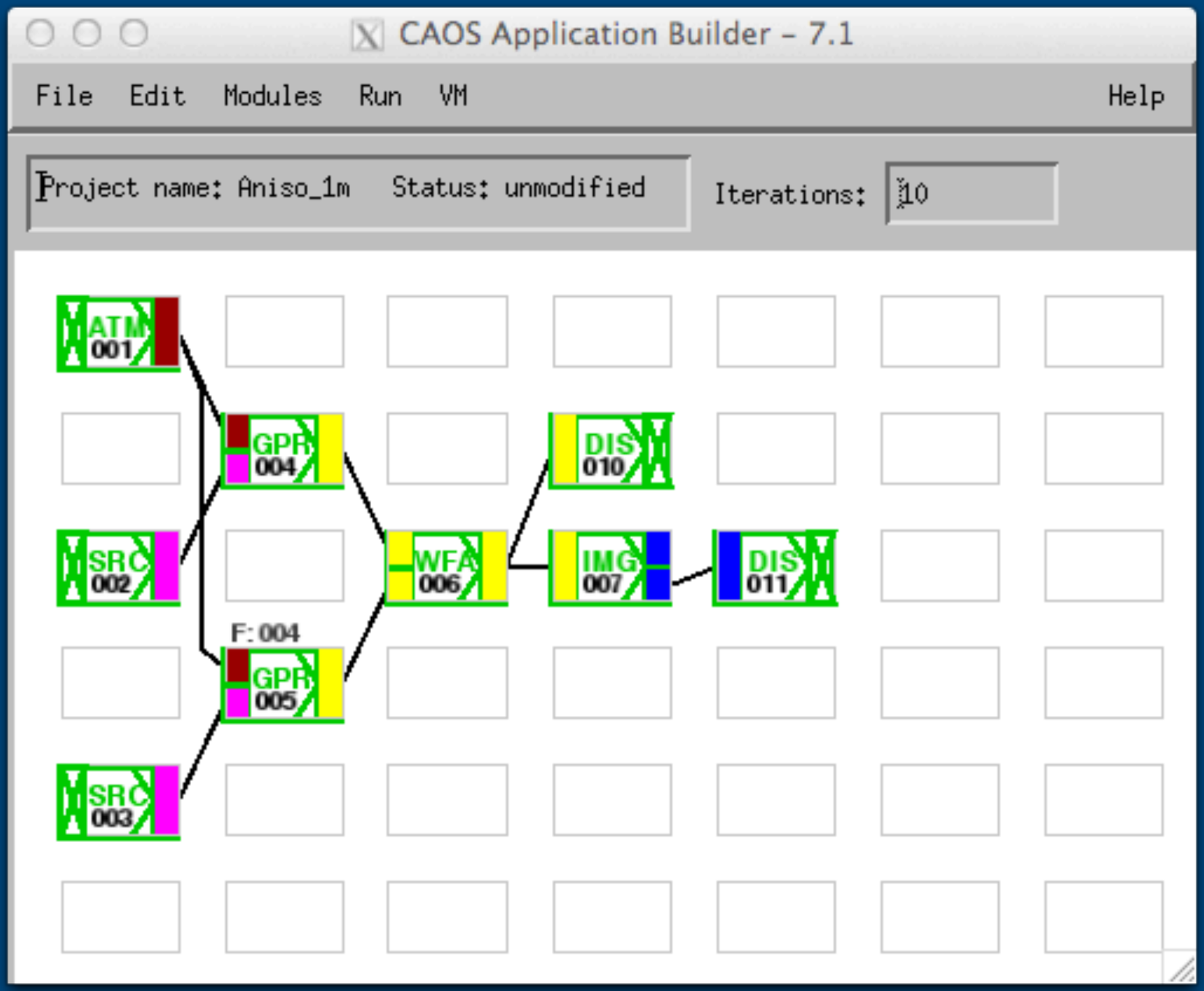
Table 1. The 31 modules of the **Software Package CAOS**, version 7.0.

Module	Purpose
Optical turbulence & image formation	
ATM - ATMosphere building	-builds the turbulent atmosphere (FFT+subharmonics, Zernike) (see also utility **PSG - Phase Screen Generation**)
SRC - SouRCe definition	-characterizes the guide star/observed object
GPR - Geometrical PRopagator	-propagates light from source to telescope through atmosphere
IMG - IMaGing device	-forms an image of the observed object (+detector noises)
Wavefront sensing	
PYR - PYRamid wavefront sensor	-simulates the pyramid wavefront sensor
SLO - SLOpe computation	-computes the slopes from the pyramid signals
SWS - Shack-Hartman Wavefront Sensor	-simulates the Shack-Hartmann (SH) wavefront sensor
BQC - Barycentre/Quad-cell Centroiding	-compute the signals from the SH spots centroiding calculus
IWS - Ideal Wavefront Sensing	-applies "ideal" wavefront sensing (see text)
TCE - Tip-tilt CEntroiding	-computes and reconstructs tip-tilt
Wavefront reconstruction, control & correction	
REC - wavefront REConstruction	-reconstructs the wavefront
TFL - Time-FiLtering	-applies time-filtering after wavefront reconstruction
SSC - State-Space Control	-applies state-space control
DMI - Deformable MIrror	-simulates the behavior of a deformable mirror (DM)
TTM - Tip-Tilt Mirror	-simulates the behavior of a tip-tilt mirror
Calibration	
CFB - Calibration FiBer characterization	-defines a fiber to be used for calibration purpose
MDS - Mirror Deformation Sequencer	-generates a sequence of DM modes or influence functions
SCD - Save Calibration Data	-saves the calibration data (interaction matrix+set of deformates)
Wide-field AO	
AVE - signals AVEraging	-averages measurements from various wavefront sensors
COM - COMbine measurements	-combines measurements from various wavefront sensors
DMC - Deformable Mirror Conjugated	-corrects at different conjugated altitudes
Other modelling modules	
LAS - LASer characterization	-defines laser projector characteristics
NLS - Na-Layer Spot definition	-characterizes the Sodium-layer behavior
IBC - Interferometric Beam Combiner	-combines the light from two apertures
COR - CORonagraphic module	-simulates various coronagraphs (Lyot, Roddier&Roddier, FQPM)
AIC - Achromatic Interfero-Coronagraph	-simulates the Achromatic Interfero-Coronagraph
BSP - Beam SPlitter	-splits the light beam
Other utility modules	
WFA - WaveFront Adding	-adds or combines together wavefronts
ATA - ATmosphere Adding	-adds or combines together atmospheres
IMA - IMage Adding	-adds or combines together images
STF - STructure Function	-calculates the structure function and compares to theory

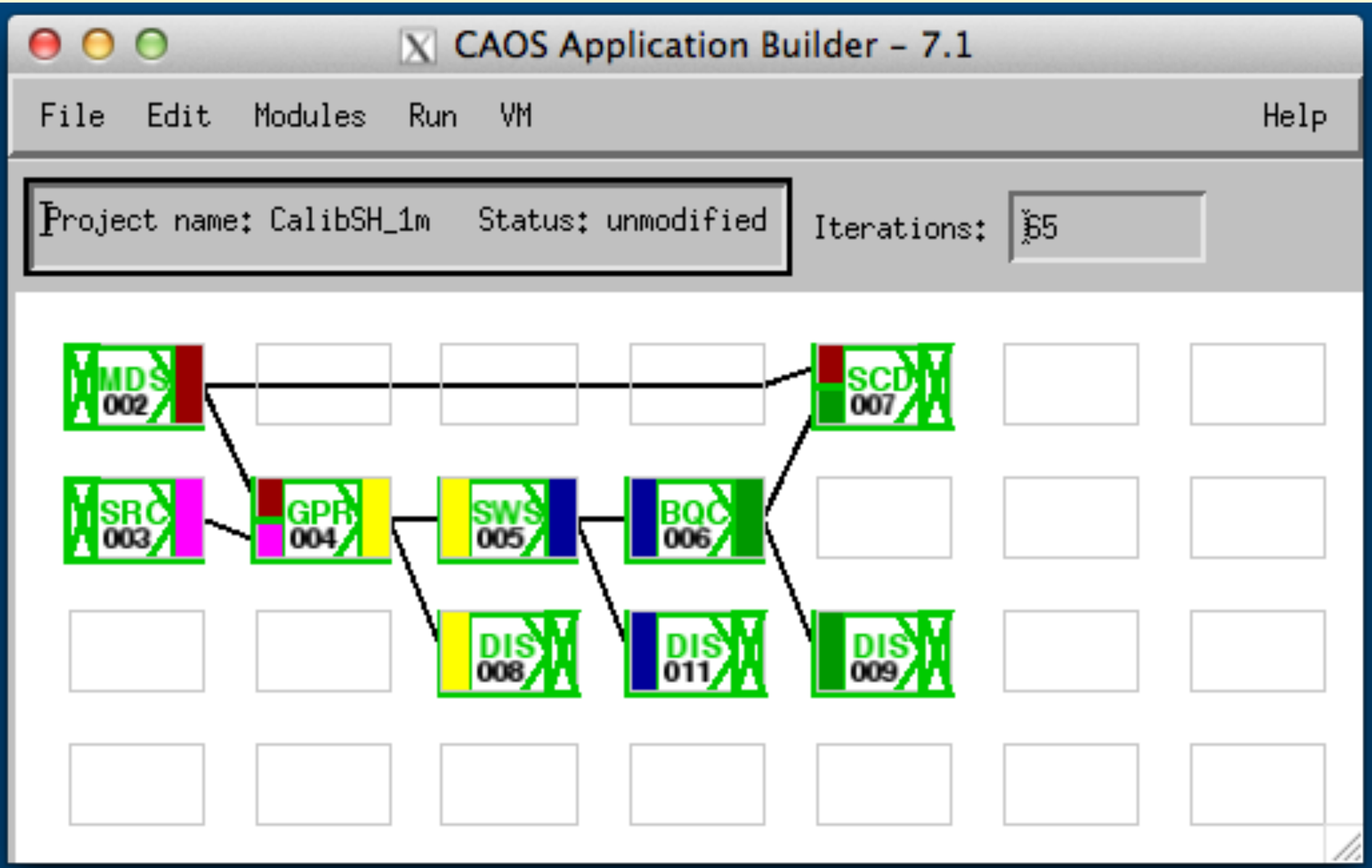
Imaging through the turbulent atmosphere: loss of resolution !



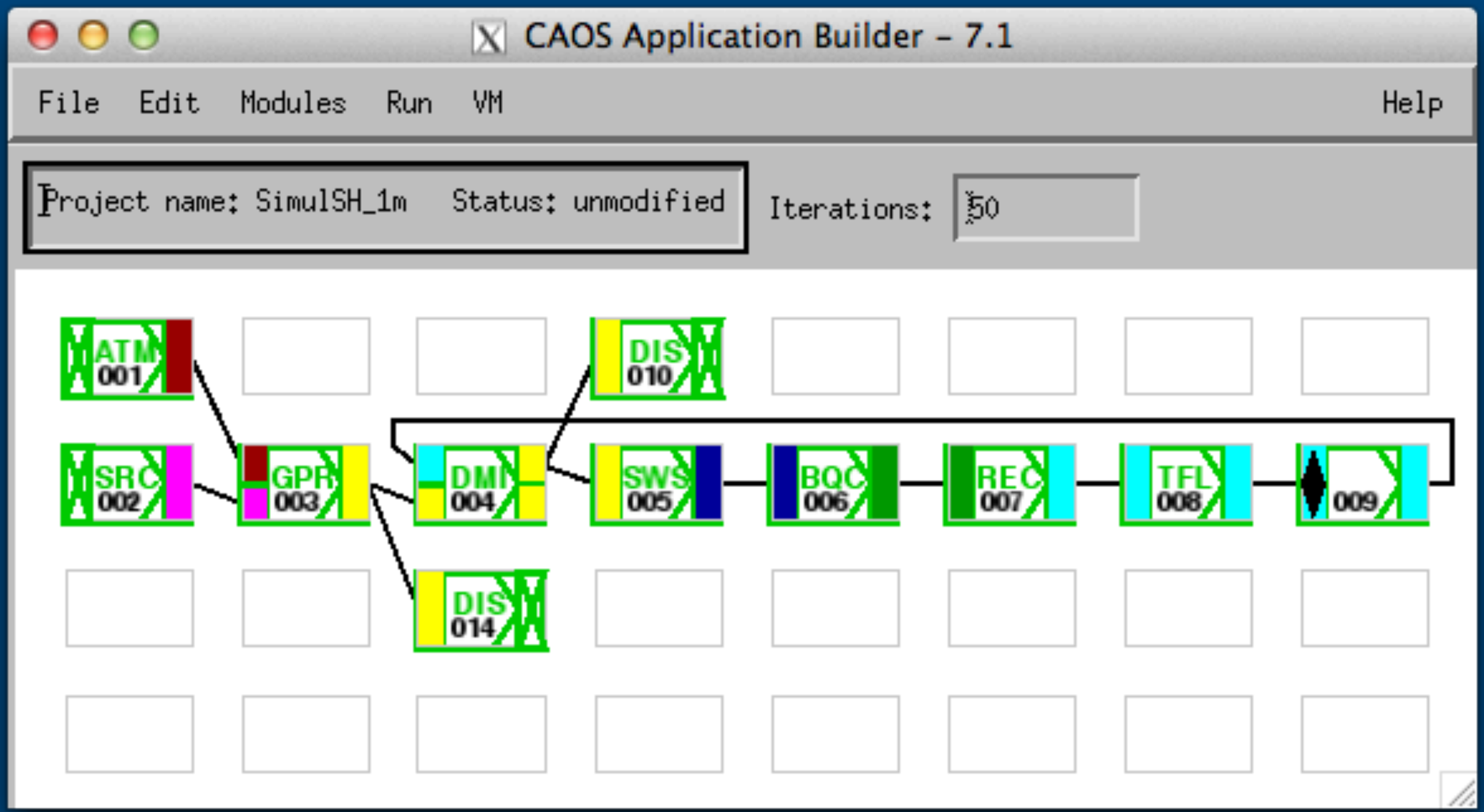
Imaging through the turbulent atmosphere: anisoplanatism !



End-to-end simulation of a complete AO system: calibration



End-to-end simulation of a complete AO system: running...



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Partie(s) théorique(s)
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+ Exercices de cours                                                [04.5/05]
+ Présentation du papier de Rigaut                                  [04.5/05]
+ Performance d'un système d'OA en fct du bruit de photon uniquement [XX.X/20]
détail :
. mise en contexte et modélisation sous CAOS                        [XX.X/05]
. optimisation du gain                                              [XX.X/05]
. rms(N_phot) et rms(mag.)                                          [XX.X/04]
. => retrouver que var_phot $\propto$ 1/N                           [XX.X/01]
. Strehl(mag, lambda) et ccl                                        [XX.X/05]
+ Rapport wfsensing (Aziz Ziad)                                    [XX.X/20]
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SOUS-TOTAL                                                    --> [XX.X/50]
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