

Initial NGAO Transmission Estimates

Rich Dekany
April 20, 2006

The following values are the basic transmission factors for the NGAO point design as currently envisioned.

Telescope transmission (H-band)

# of mirrors (exposed)	3 @ 0.85	=	0.614 (<-- replace w/ measured value)
------------------------	----------	---	---------------------------------------

NGAO Optical Relay

# of mirrors (Al)	5 @ 0.97	=	0.859 (4 mirror relay + 1 turning mirror)
# of air/glass	6 @ 0.98	=	0.886 (double input window + dichroic) (assume AR coat for NIR)
Subtotal			0.761

IR-MOS

# of mirrors (Al)	4 @ 0.97	=	0.885 (object-selection mechanism)
# of mirrors (Au)	7 @ 0.985	=	0.900 (cryostat)
# of vacuum/glass	10 @ 0.988	=	0.886 (5 lenses, NIR coated)
Grating efficiency	1 @ 0.60	=	0.600 (function of grating details)
Filter efficiency	1 @ 0.90	=	0.900
Subtotal			0.381
IR array H-band QE			0.850 (2.5um cut-off HgCdTe)
Subtotal			0.324

Visible imager

# of mirrors (Al)	2 @ 0.97	=	0.941 (OAP relay)
# of air/glass	8 @ 0.98	=	0.851 (1 window + 1 filter + 2 ADC prism)
ADC glass/glass	2 @ 0.99	=	0.980
ADC absorption	1 @ 0.98	=	0.980
Filter efficiency	1 @ 0.95	=	0.950
Subtotal			0.730
CCD red QE			0.850 (deep depletion CCD)
Subtotal			0.621

Summary

Transmission thru Telescope & Relay	0.47	
Total for IR-MOS (incl. QE)		0.15
Total for Visible Imager (incl. QE)	0.29	