

## APLC Design Summary

Instrument	USORT
nPup	128 x 128 pixels
Coronagraphic throughput (transmitted energy)	0.1423
Core throughput (encircled energy)	0.12
Lyot stop inner diameter (% of inscribed circle)	0.0
Lyot stop outer diameter (% of inscribed circle)	0.99
Bandpass	20.0%
# wavelengths	5
FPM radius (grayscale)	3.5 $\lambda/D$
nFPM	150 pixels
IWA — OWA	3.4—14.0 $\lambda/D$
Contrast constraint	$10^{-10}$
Lyot Stop alignment tolerance	0 pixels

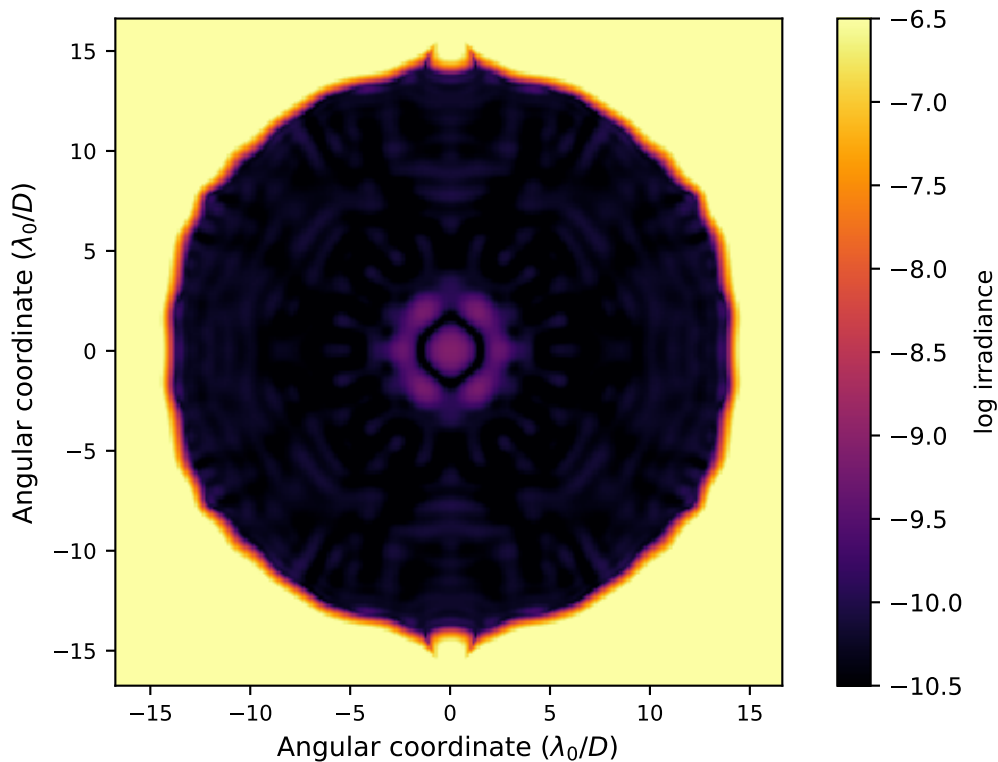
### Input Files :

- ▷ *Pupil file* : USORT/TelAp\_USORT\_offaxis\_ovsamp16\_N0128.fits
- ▷ *Lyot stop file* : USORT/LS\_USORT\_circ\_ID0000\_OD0990\_ovsamp16\_N0128.fits

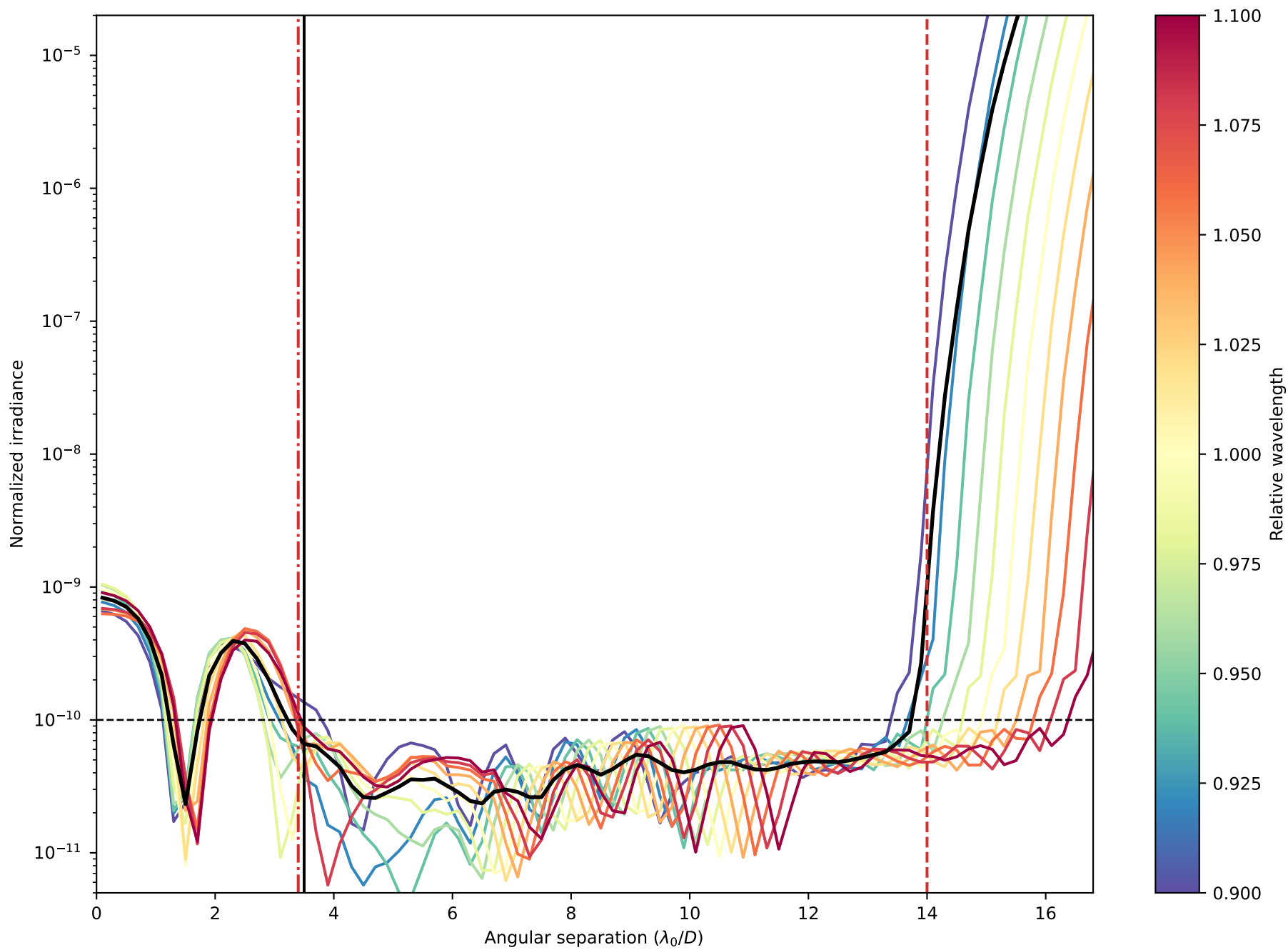
### Solution File :

▷ 02\_USORT\_N128\_FPM350M0150\_IWA0340\_OWA01400\_C10\_BW20\_Nlam5\_LS\_IDc\_ID0\_OD\_OD0\_ls\_90\_ovsamp16\_fits

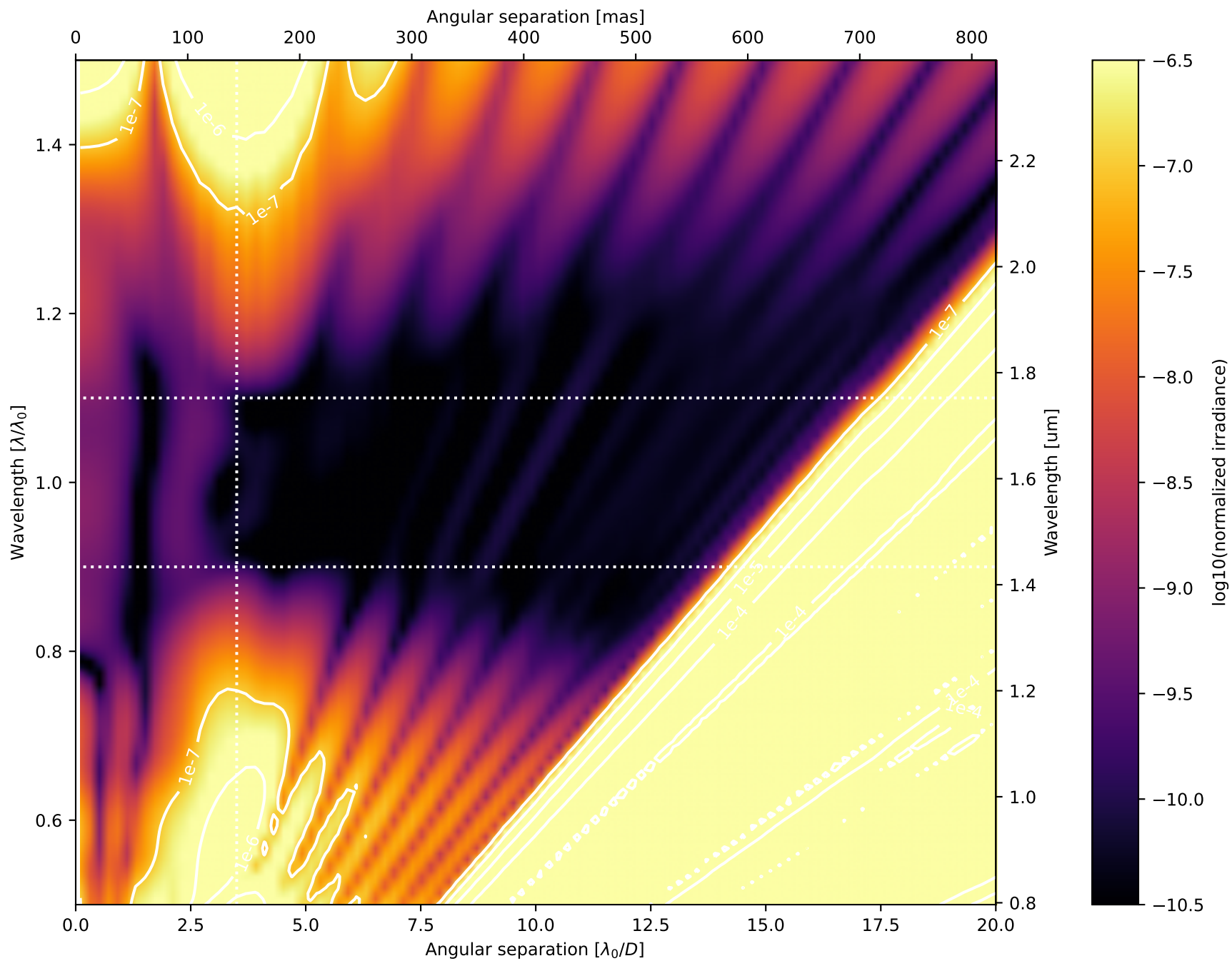
Fri Oct 27 15:26:15 2023

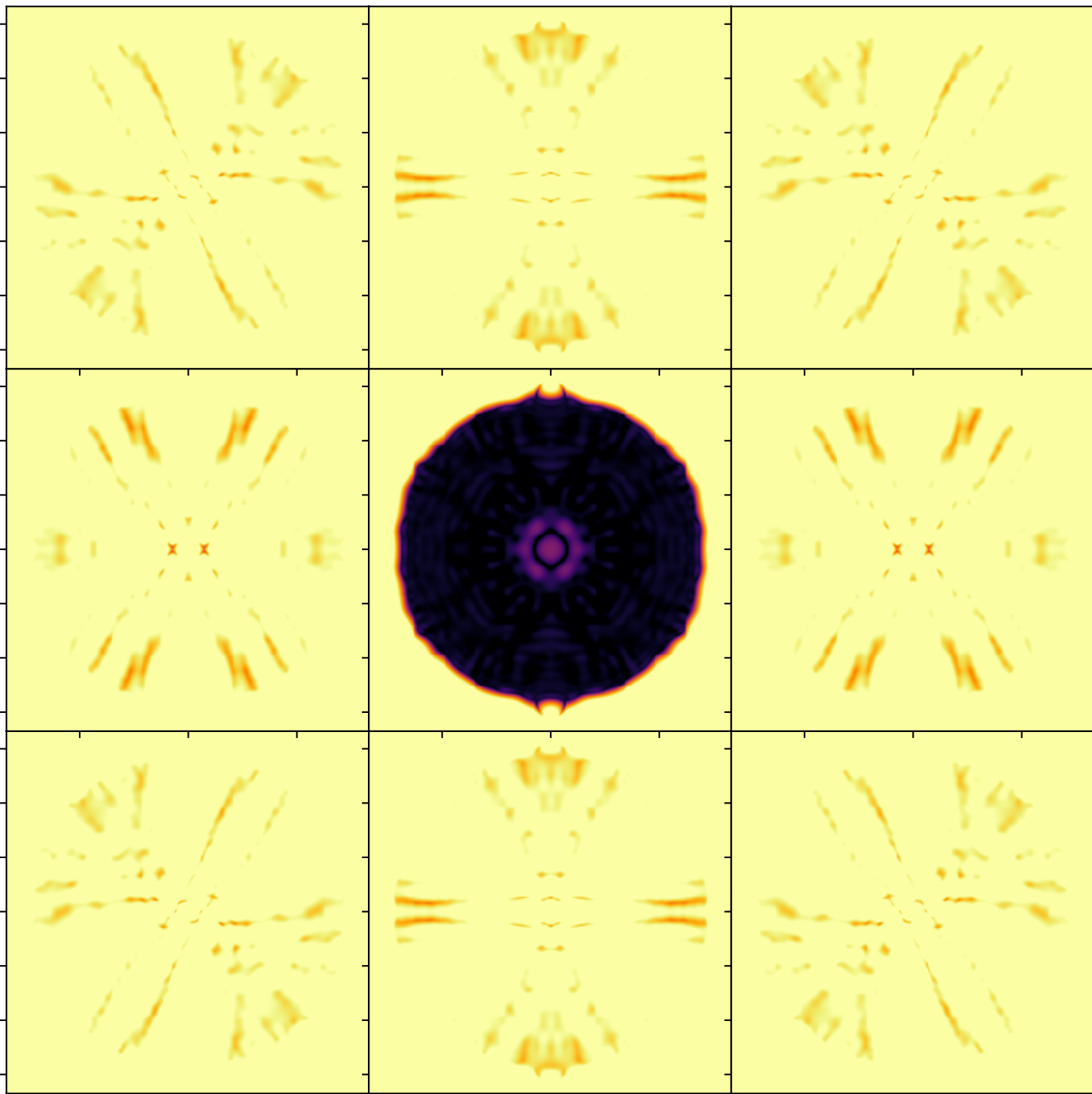


*On – axis PSF in log irradiance,  
normalized to the peak irradiance value.*

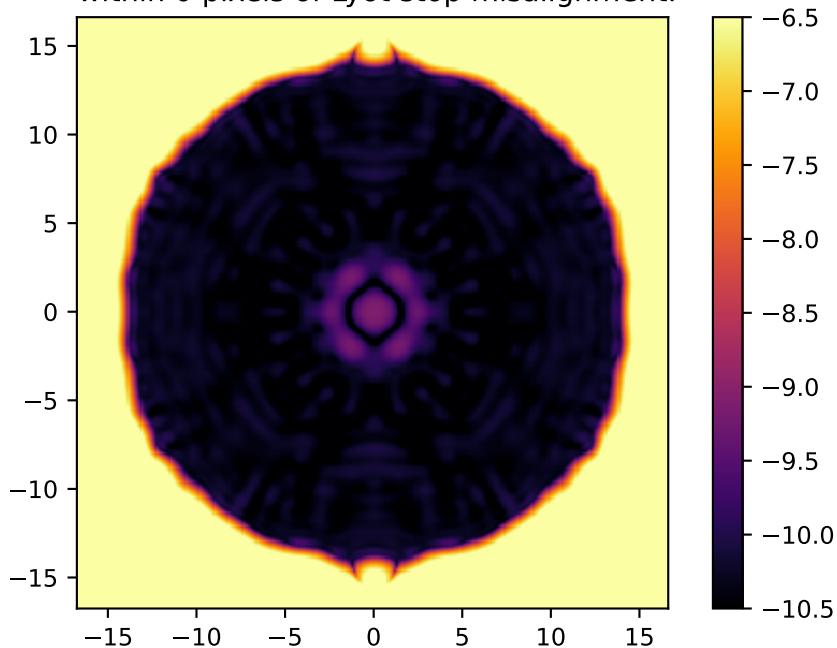


Radial intensity profile for the broadband APLC design at 11 simulated wavelengths centered around  $\lambda_0/D$  and equally spatially sampled over the 20.0% bandpass. The black curve shows the average intensity across the 11 wavelength samples. The dashed red vertical lines delimit the high-contrast dark zone (between  $3.4$  and  $14.0 \lambda_0/D$ ). The blue dotted line delimits the FPM radius, set to  $3.5 \lambda_0/D$ .





Average broadband normalized irradiance  
within 0 pixels of Lyot stop misalignment.



# Analysis Summary

Apodizer &  
Telescope Aperture

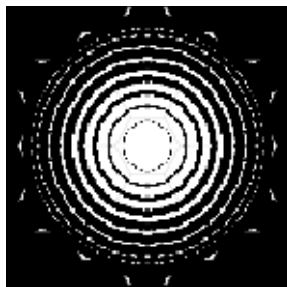


Image plane

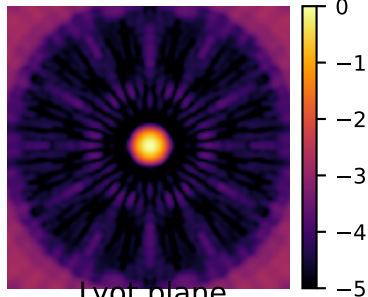
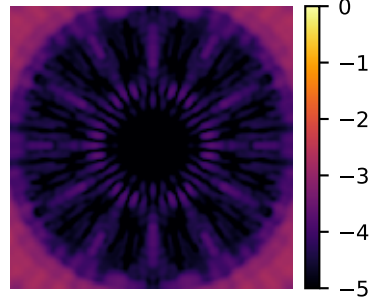
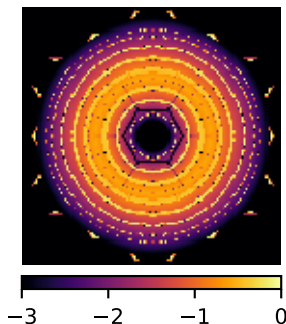


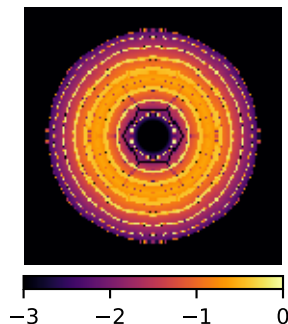
Image plane  
w/FPM



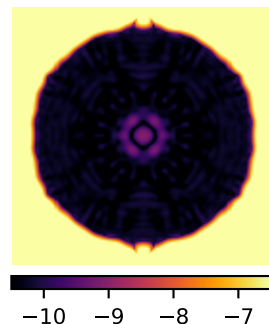
Lyot plane

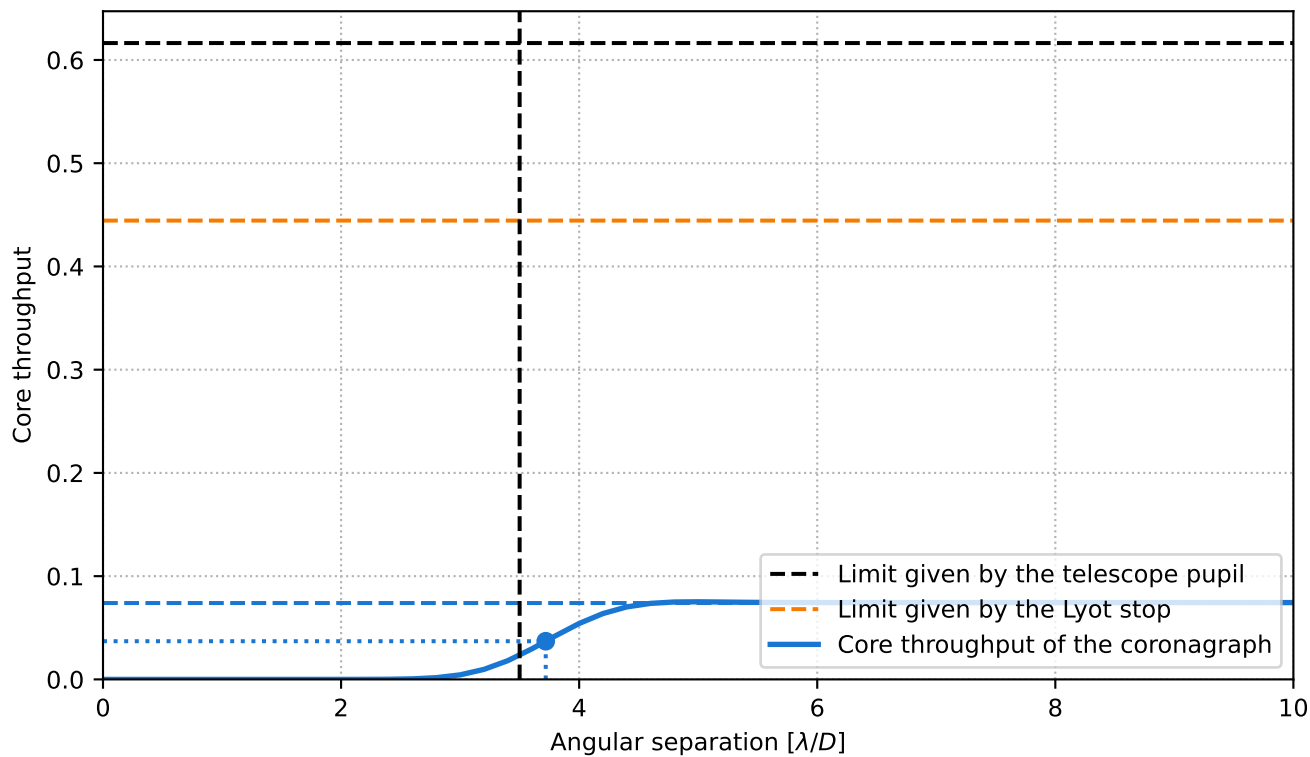


Lyot plane  
w/lyot stop



Final image plane

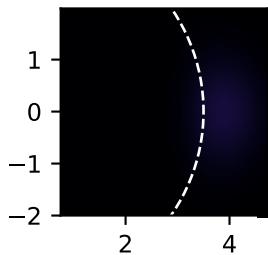




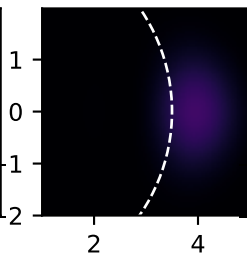
Pupil core throughput:	0.6163835963822561
Lyot stop core throughput:	0.444429515374317
Maximum core throughput:	0.0739669117087496
Maximum core throughput w.r.t. pupil core throughput:	0.12000142791418206
Maximum core throughput w.r.t. Lyot stop core throughput:	0.16643114183460922
Inner working angle:	3.719230382118739 $\lambda_0/D$



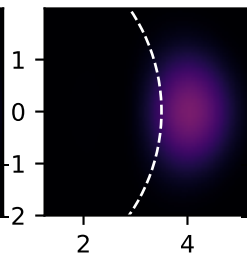
$2.75 \lambda_0/D$



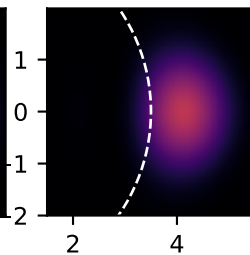
$3.00 \lambda_0/D$



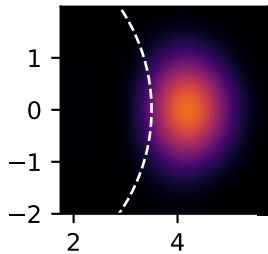
$3.25 \lambda_0/D$



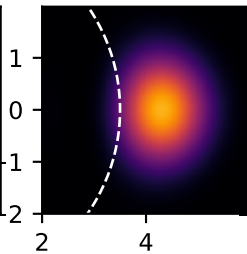
$3.50 \lambda_0/D$



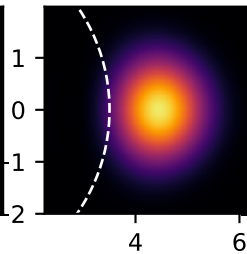
$3.75 \lambda_0/D$



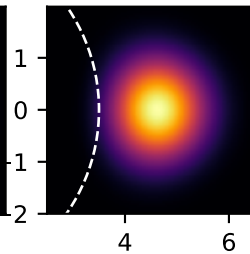
$4.00 \lambda_0/D$



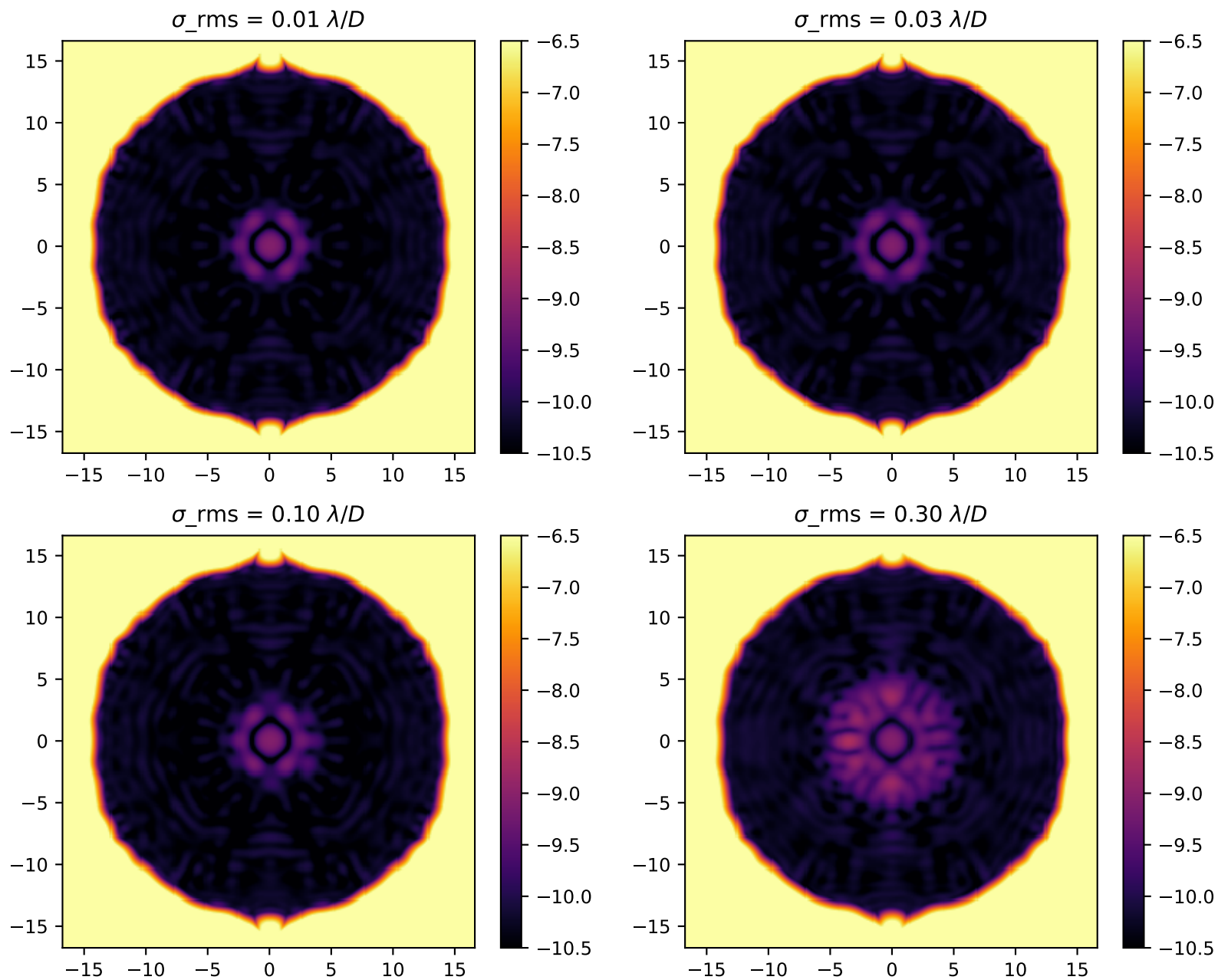
$4.25 \lambda_0/D$

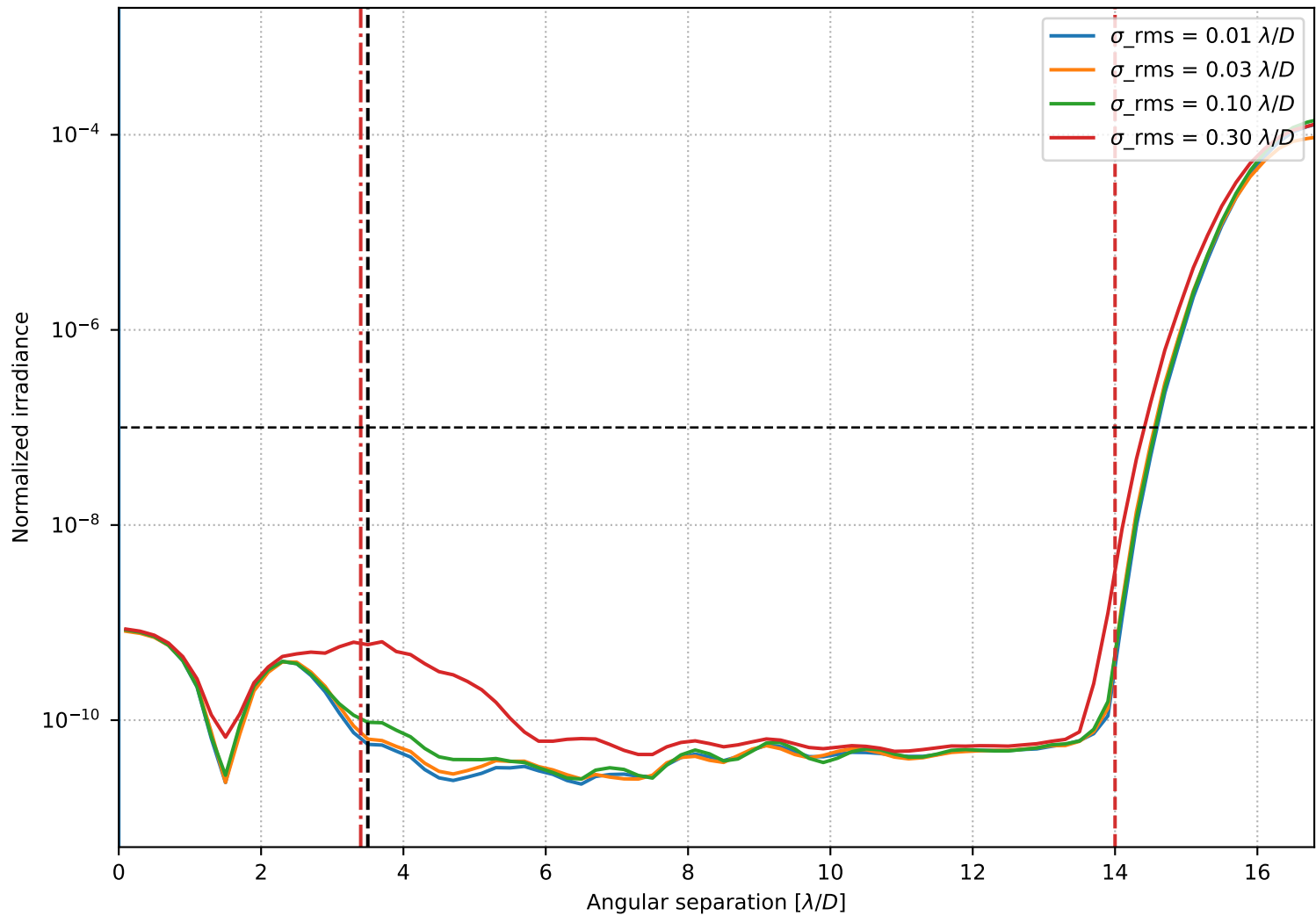


$4.50 \lambda_0/D$



Broadband normalized irradiance for four representative levels of residual pointing jitter.





Azimuthally averaged raw contrast for four representative levels of rms residual pointing jitter.