

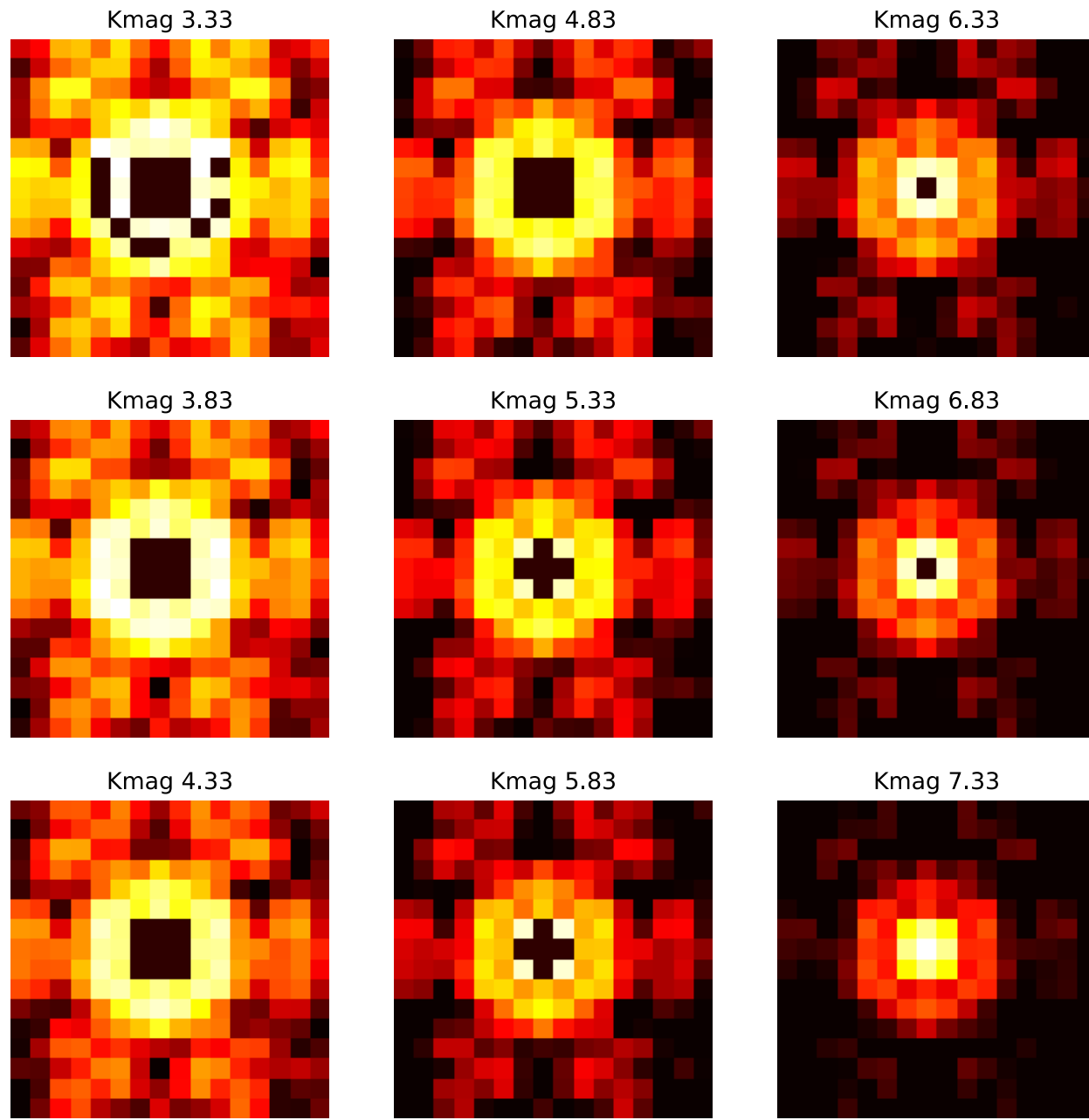
NIRCam Target Acquisition with saturated pixels

Data:

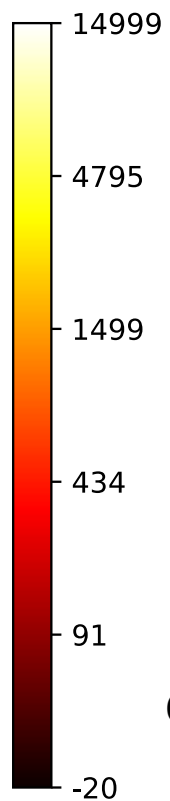
- Simulations for detector A5 time series subarray (NRCFLATA5GRTS)
- All data use F335M filter
- Data created with the NIRCam team's data simulator and WebbPSF
- Each integration contained 3 RAPID groups.
- PSF brightness scaled to simulate sources with K-band magnitudes (assuming G2V source) from 3.0 to 7.3 in 0.1 magnitude increments.
- PSF for each brightness created at each of 16 sub-pixel center locations

Centroiding:

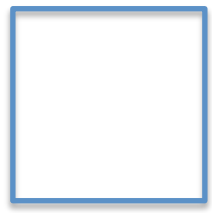
- Centroiding was performed with our own implementation of the GENTALOCATE algorithm
- Target Acq image created by taking $\min((group2-group1), (group3-group2))$ on a pixel-by-pixel basis
- Brightest central pixel found when using 3 x 3 pixel checkbox moved across detector
- 9 x 9 pixel raster window centered on brightest pixel, and centroid is computed by calculating the first moment of intensity distribution
- Raster window step iterated 10 times.

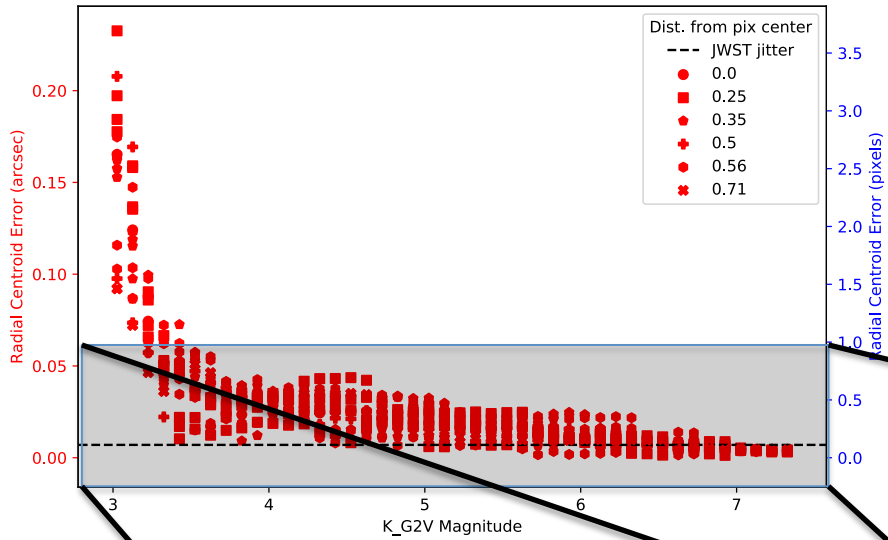


Target acq images
for PSFs centered
on a pixel



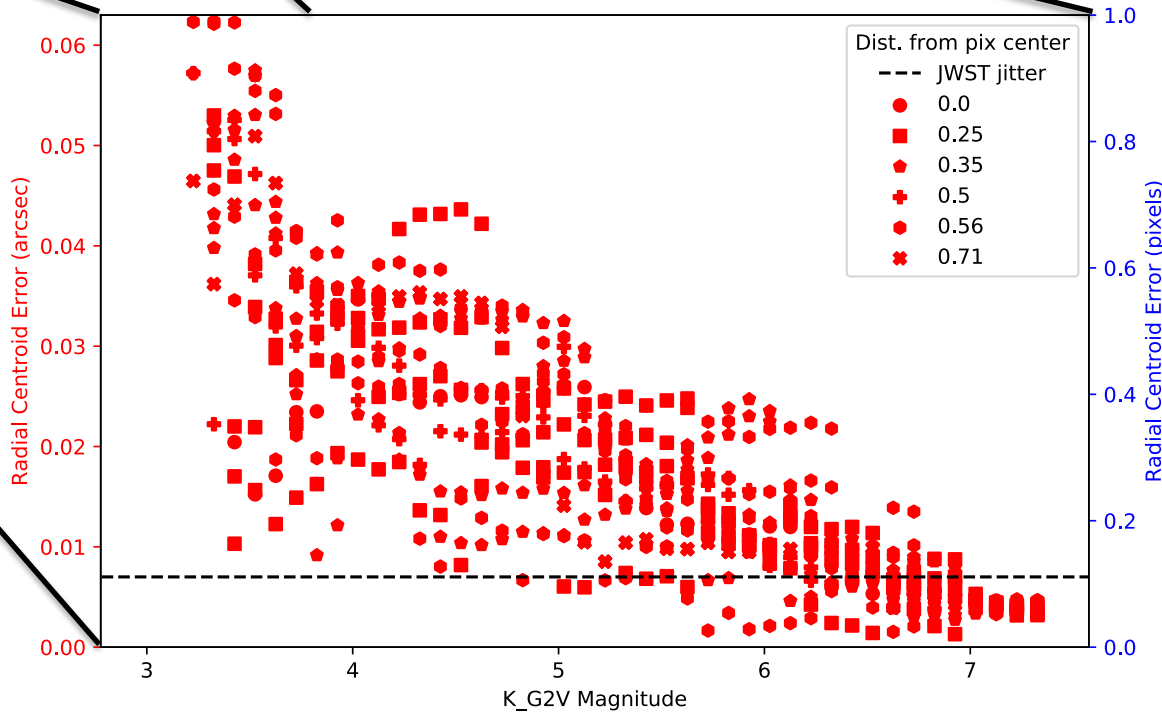
Centroid box
size: (9x9)

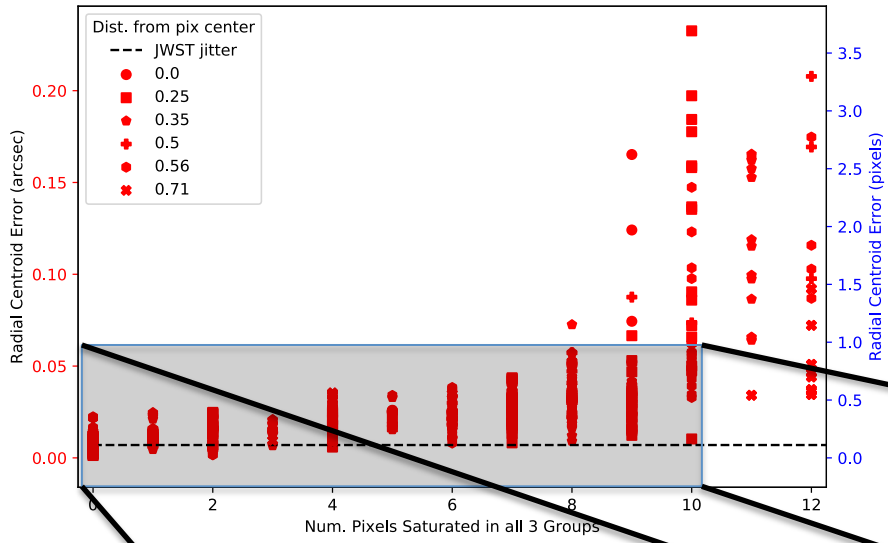




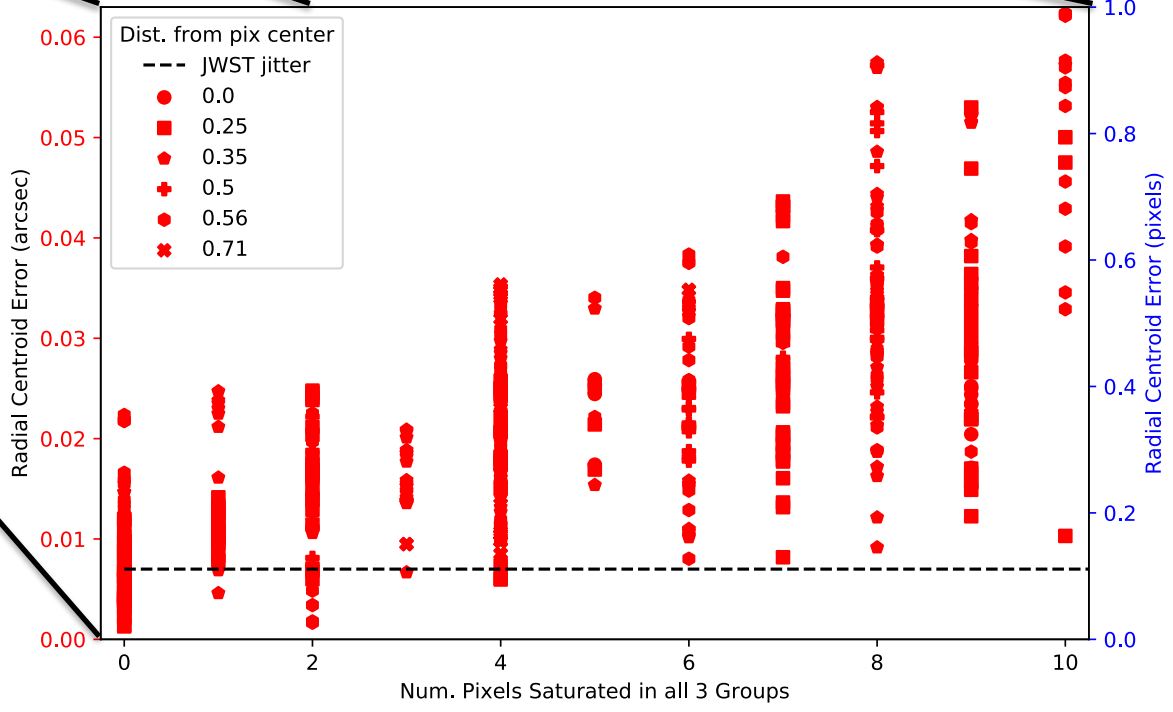
Radial centroid error
versus K band magnitude
(assuming G2V source)

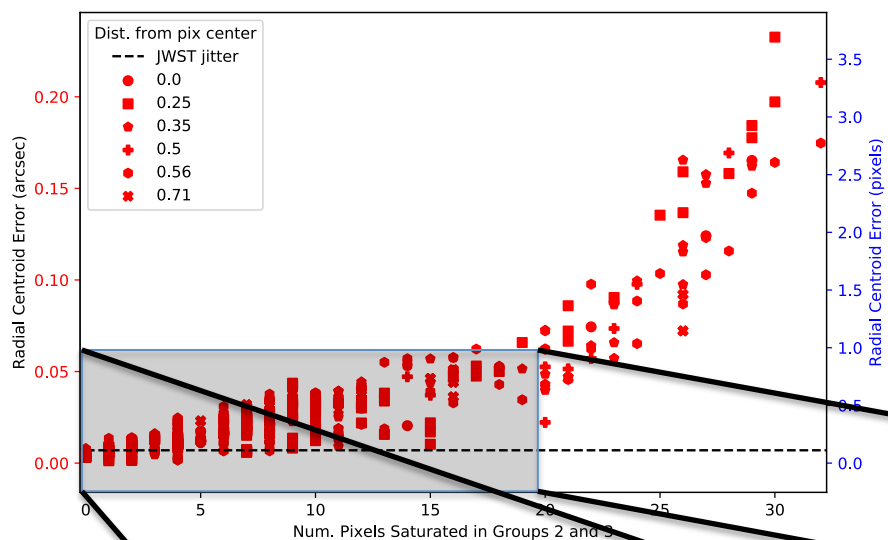
“Centroid error”
is the distance
between the true
centroid and the
value computed
by GENTALOCATE





Radial centroid error versus the number of pixels saturated in all 3 groups





Radial centroid error versus the number of pixels saturated in groups 2 and 3 (which includes pixels saturated in groups 1, 2, and 3.)

