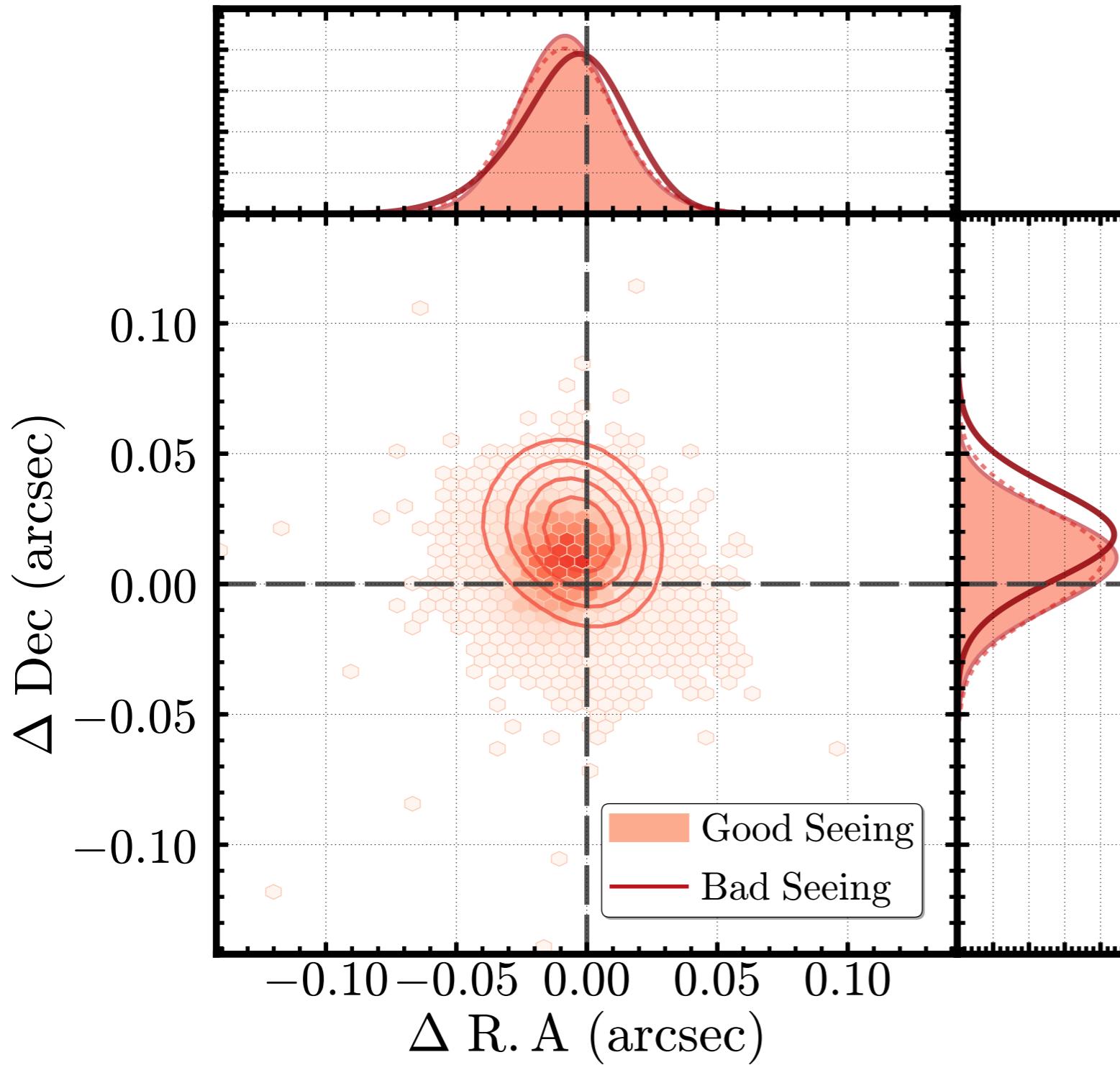


# SynPipe Tests of Stellar Objects

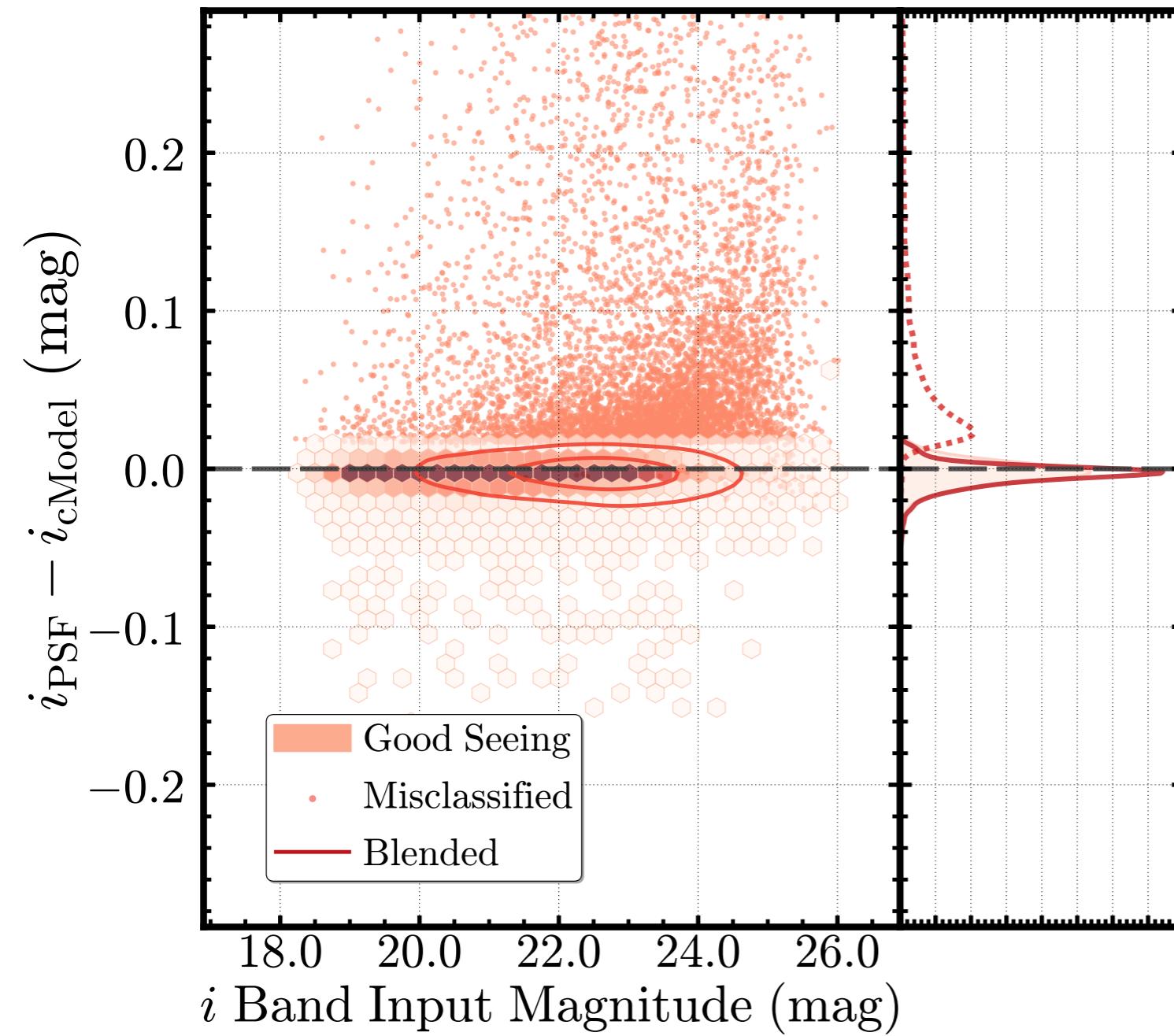
- 5-band photometry of stars are from HSC-WIDE photometry
- Tests on two Tracts with very good/bad seeings
- Exclude ambiguously blended stars via matching with the input catalogs with the HSC-WIDE catalogs
- Applied quite strict quality control cuts in each band

# Astrometric Inaccuracies



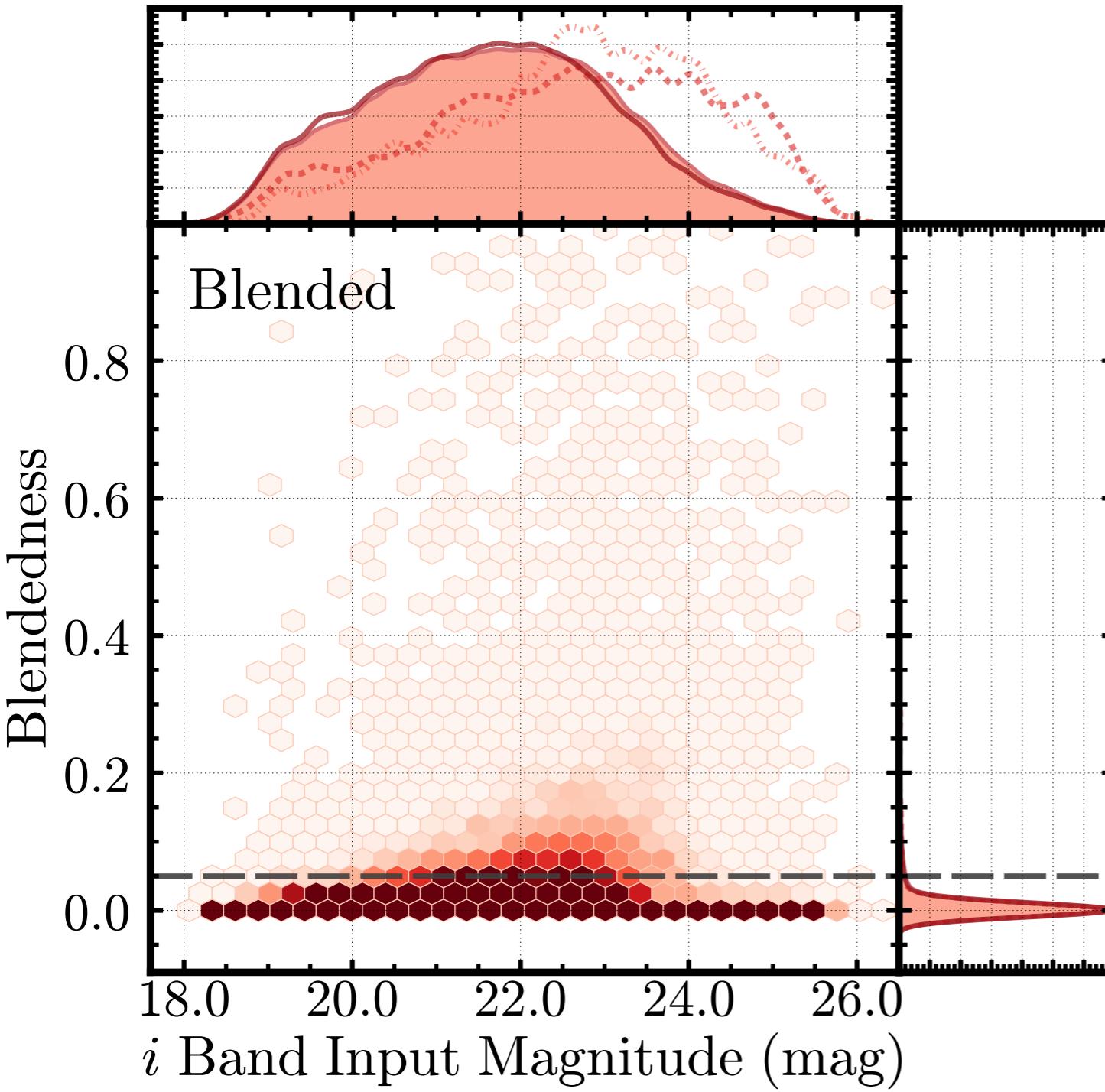
- There is still a tiny systematic astrometric uncertainties
- Offsets are slightly different in two Tracts, but not sure if it is related to seeing (only 2 Tracts are used)

# Misclassified Stars



- In each band, still a not-so-tiny (5-8%) fraction of stars is misclassified as extended objects.
- These stars are on average fainter and more blended
- Reflected clearly on the magnitude difference between PSF and cModel magnitudes

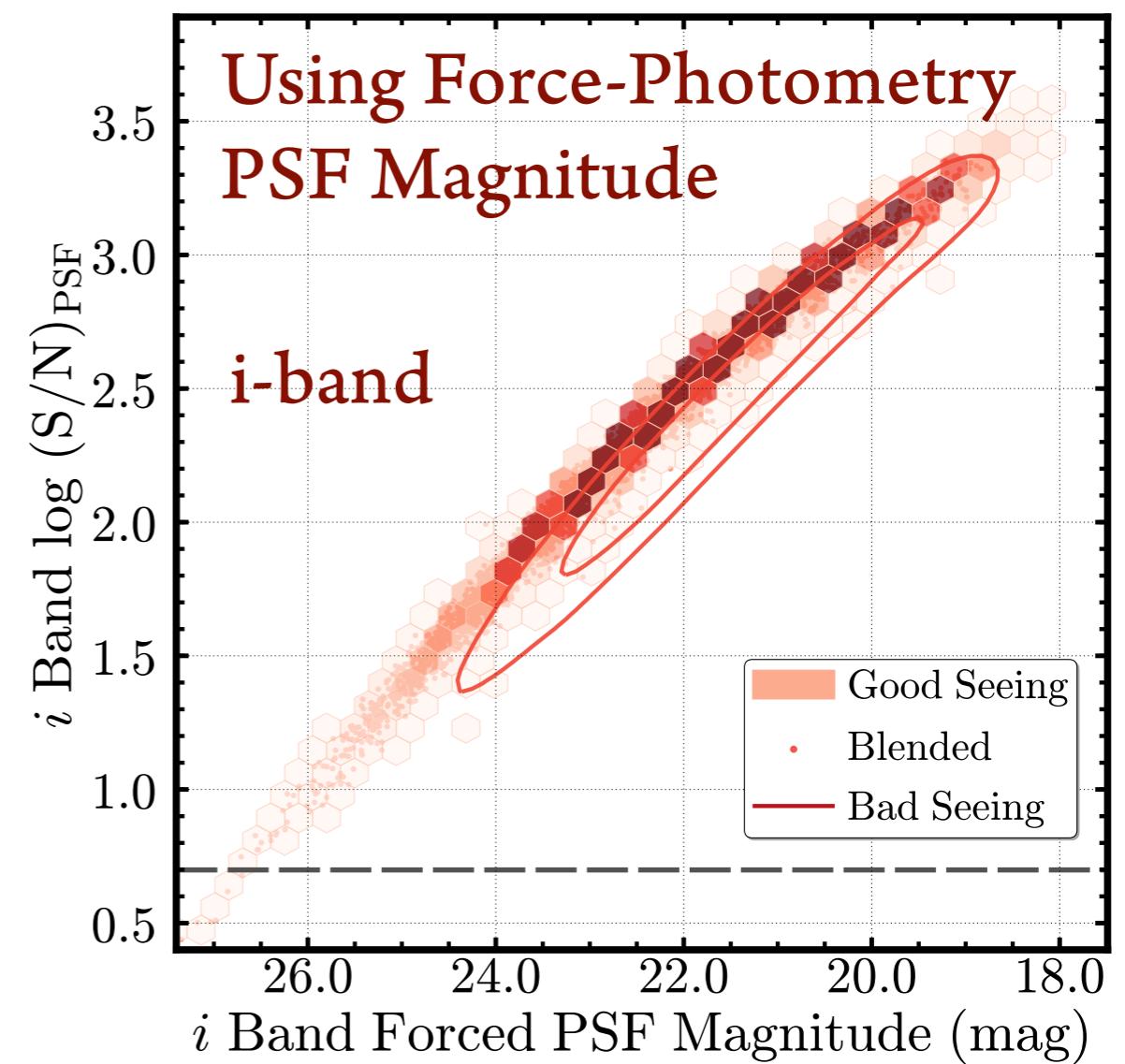
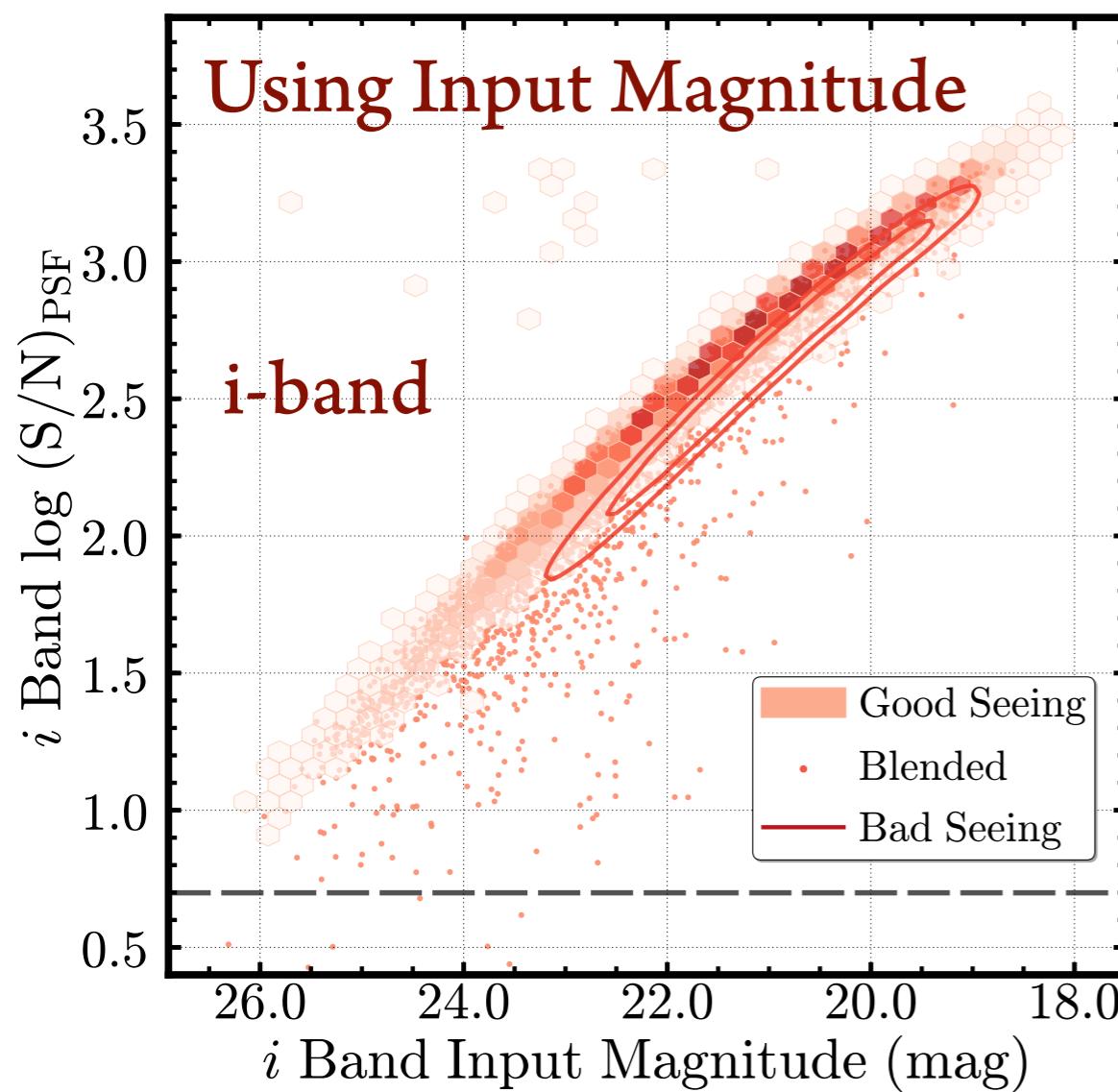
# Magnitudes and Blendedness

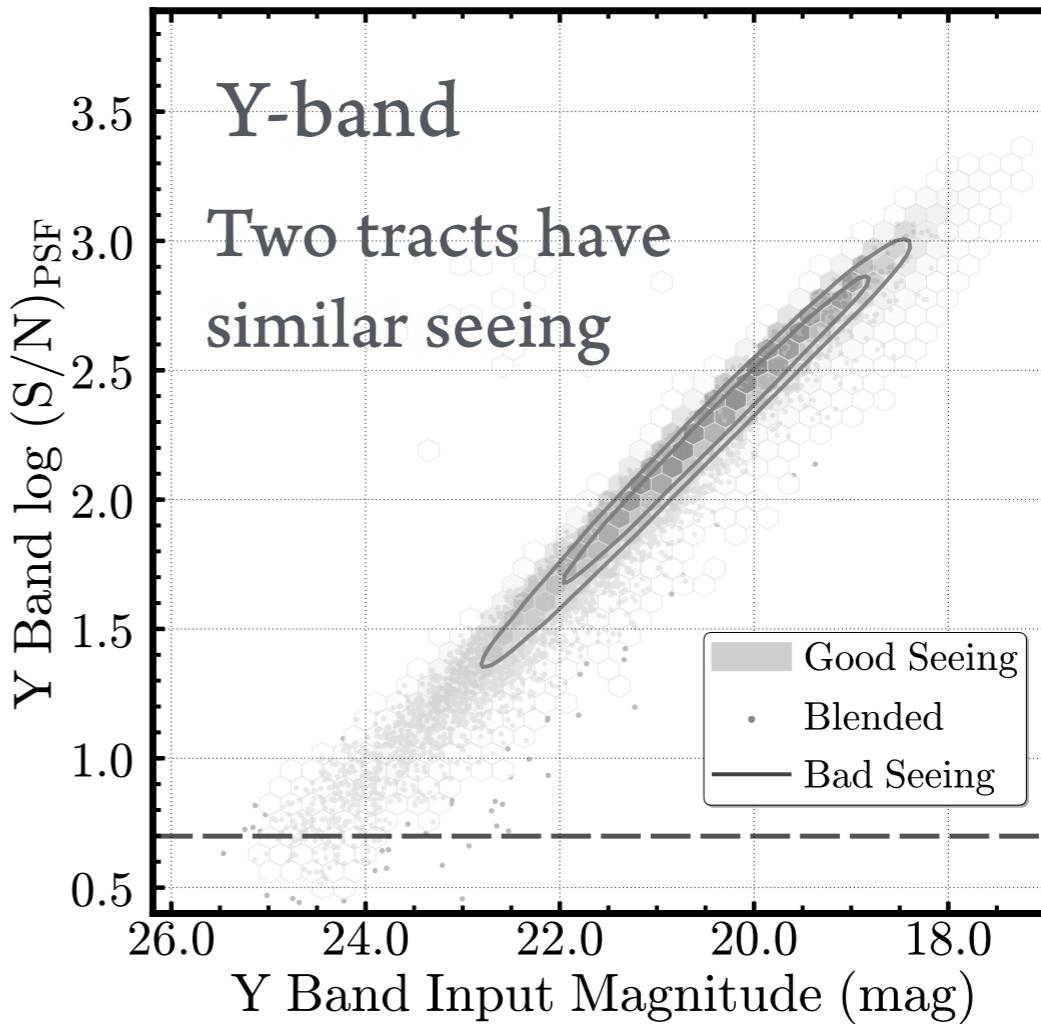
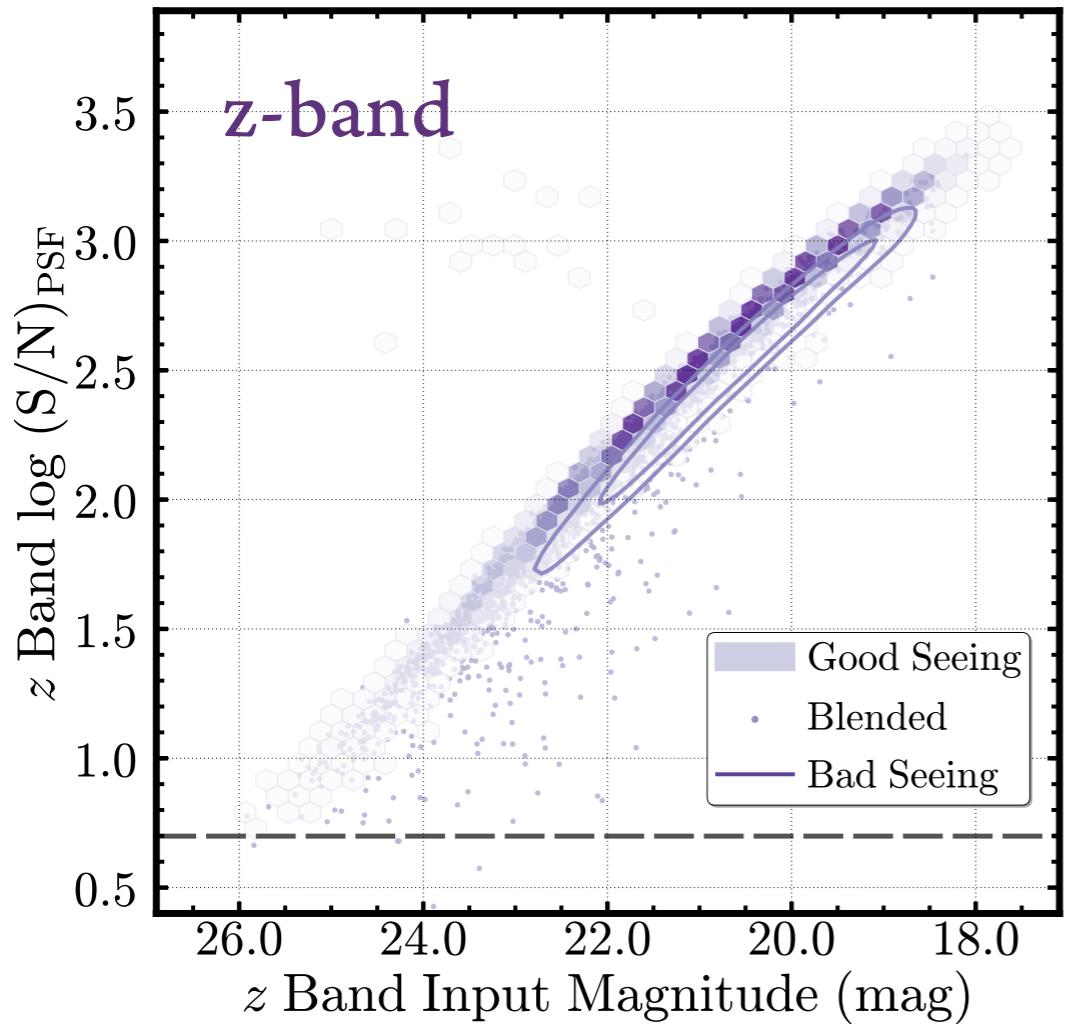
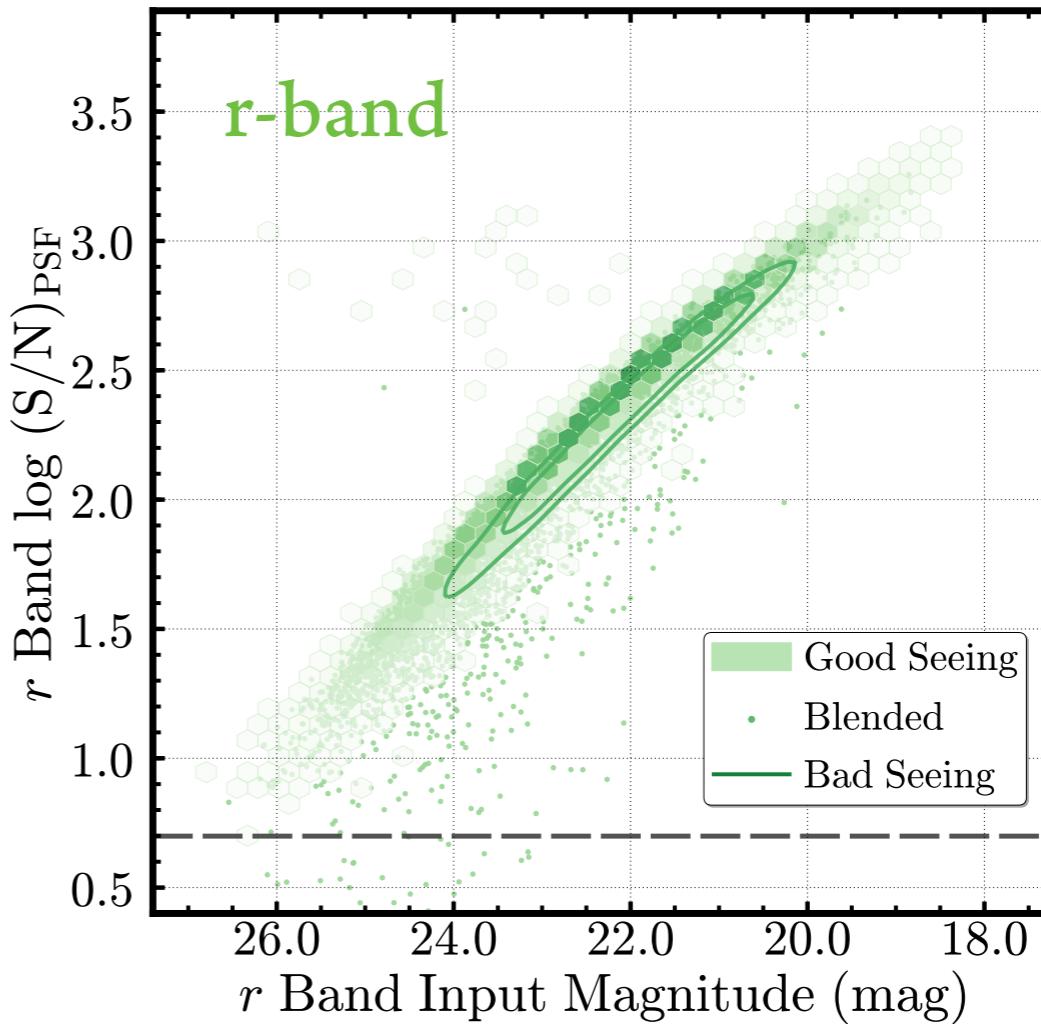
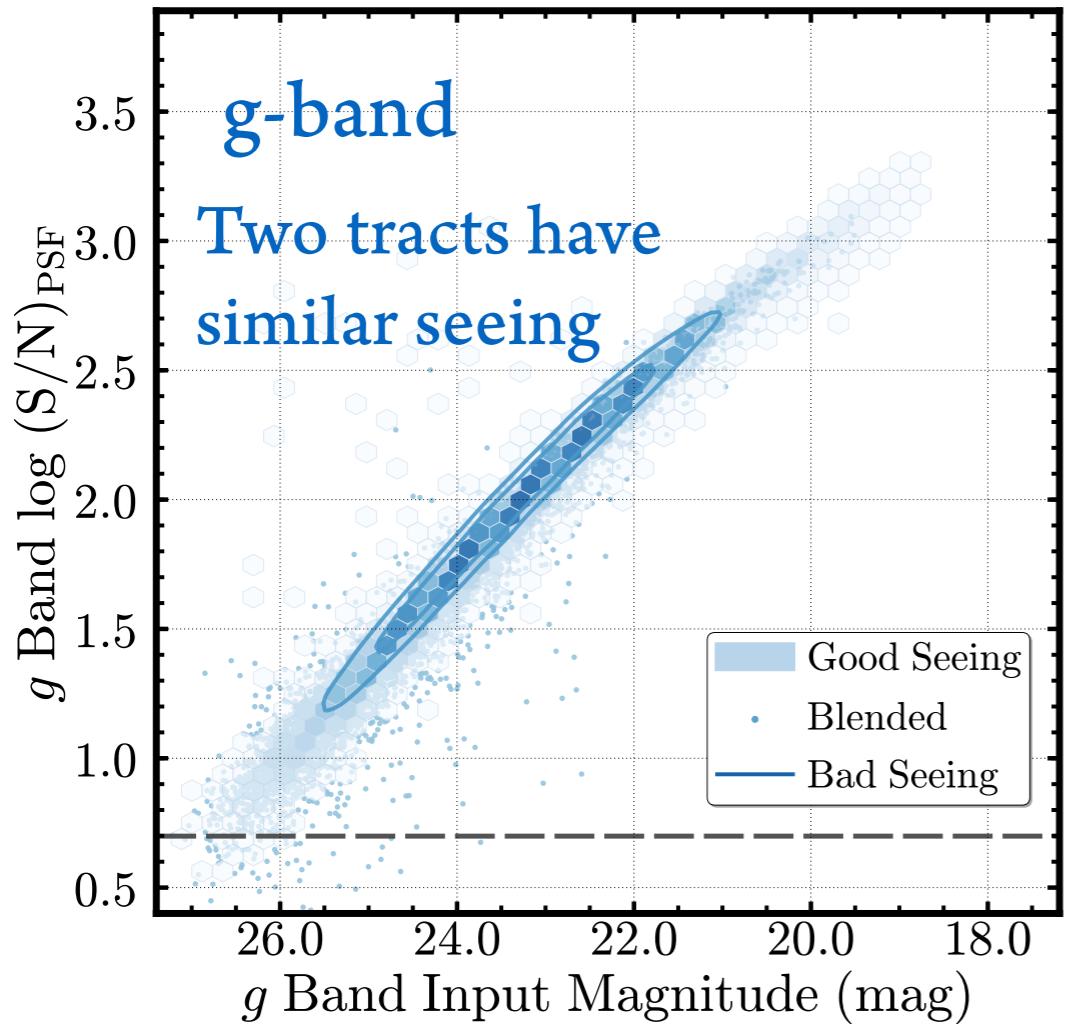


- Separate stars with i-band blendedness $>0.05$  as “Blended” sample.
- Seeing does not seem to change the distributions of blendedness significantly
- Still has a fraction of stars has negative blendedness

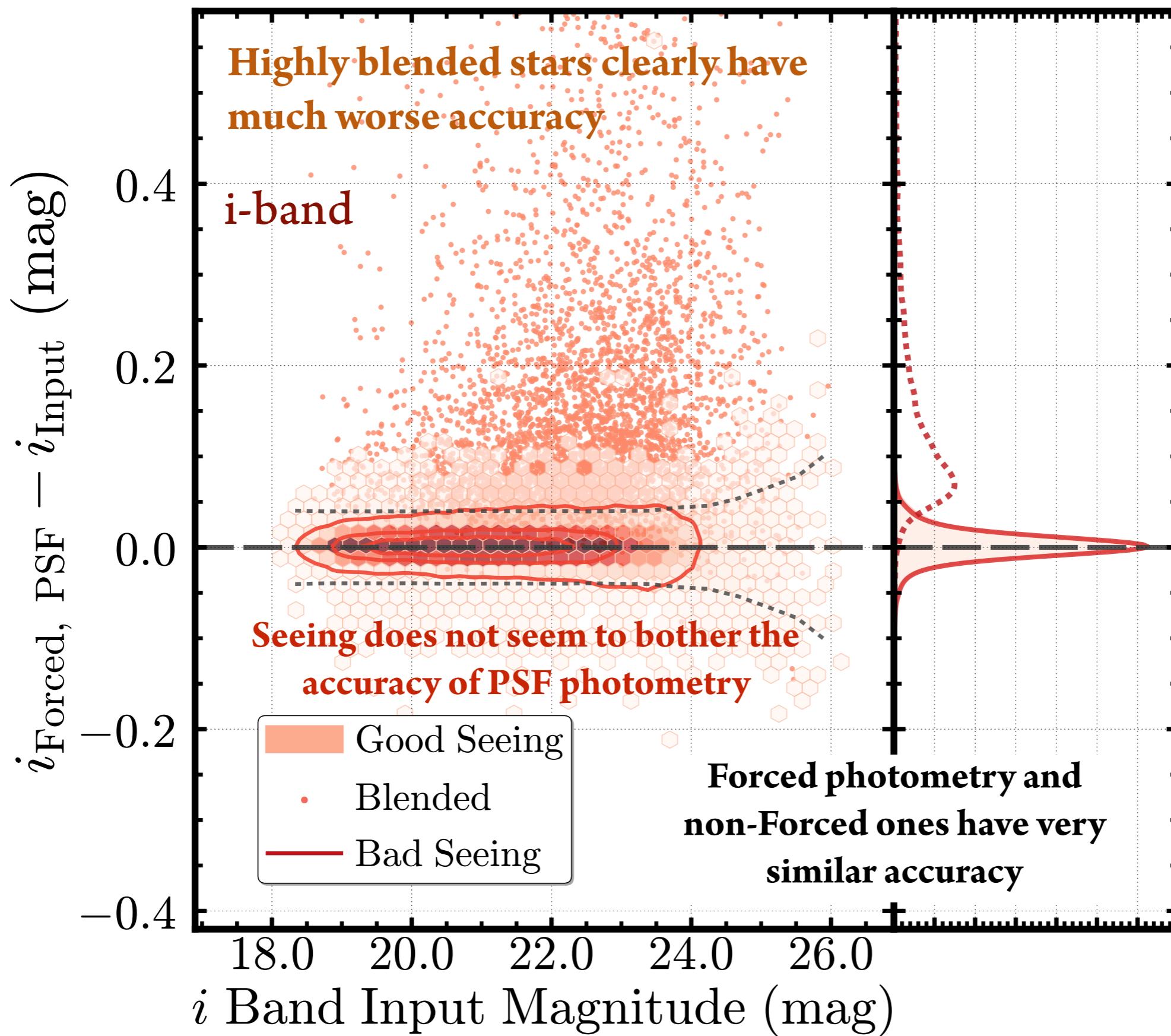
# Magnitudes and S/N of PSF Photometry

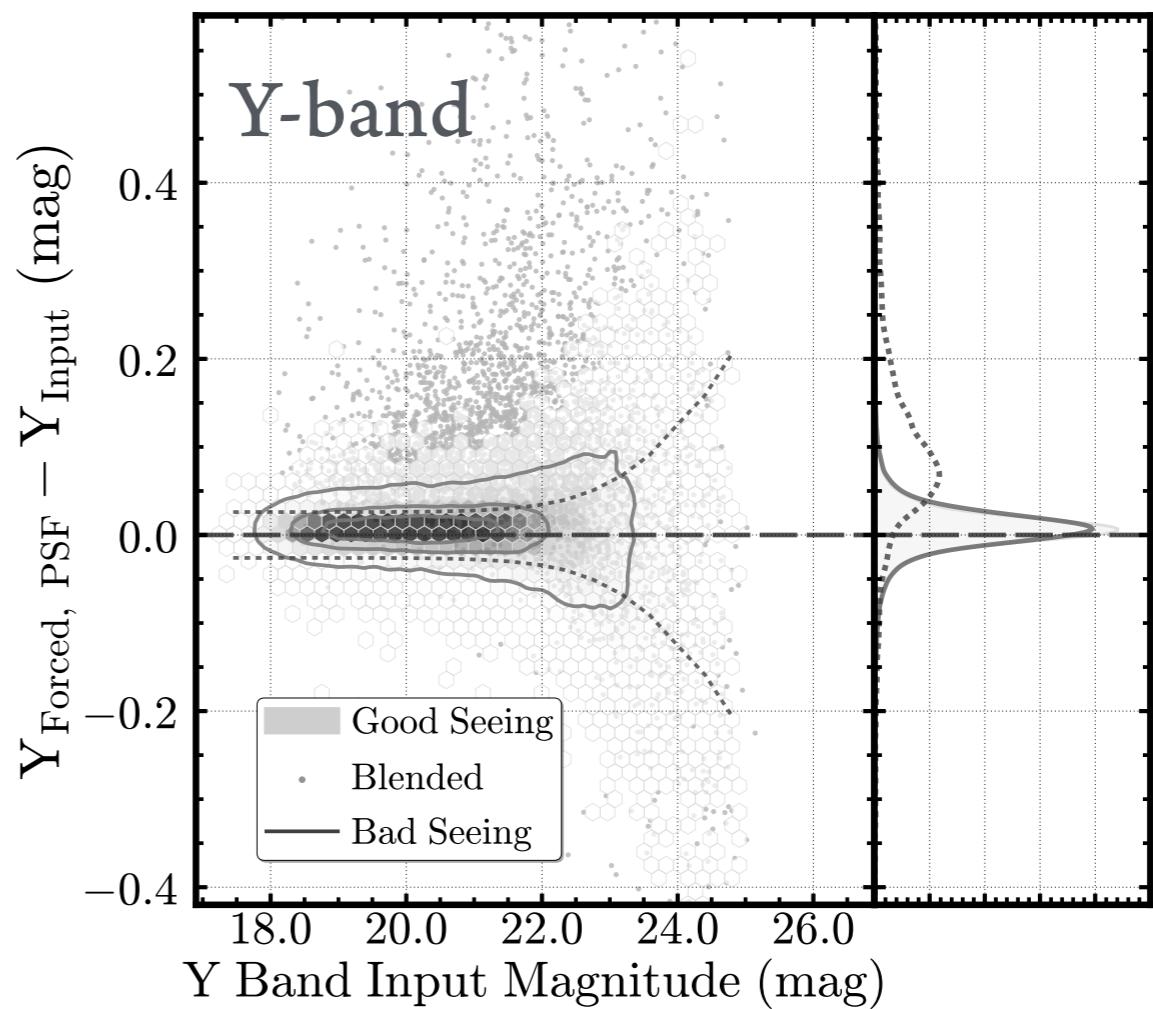
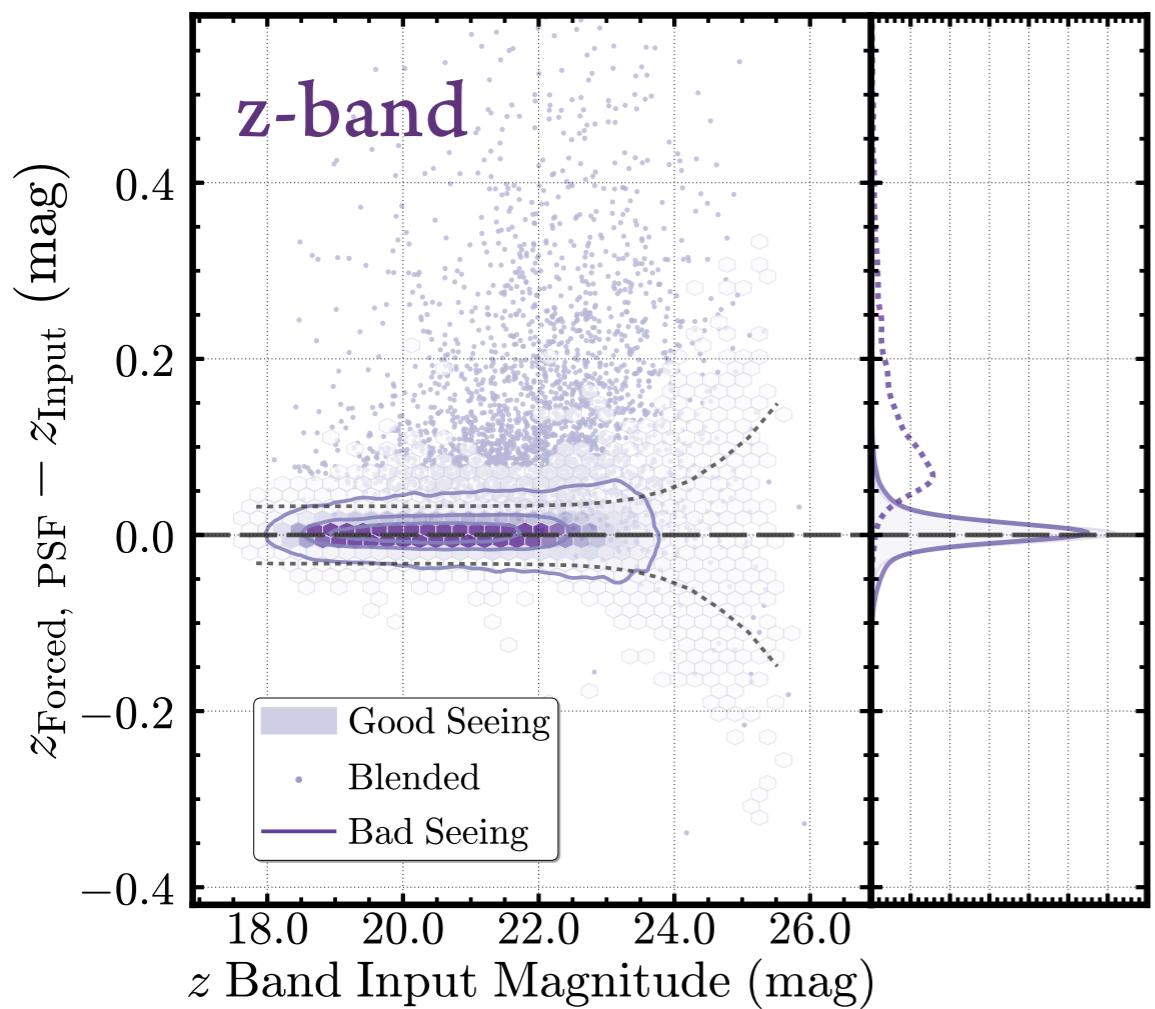
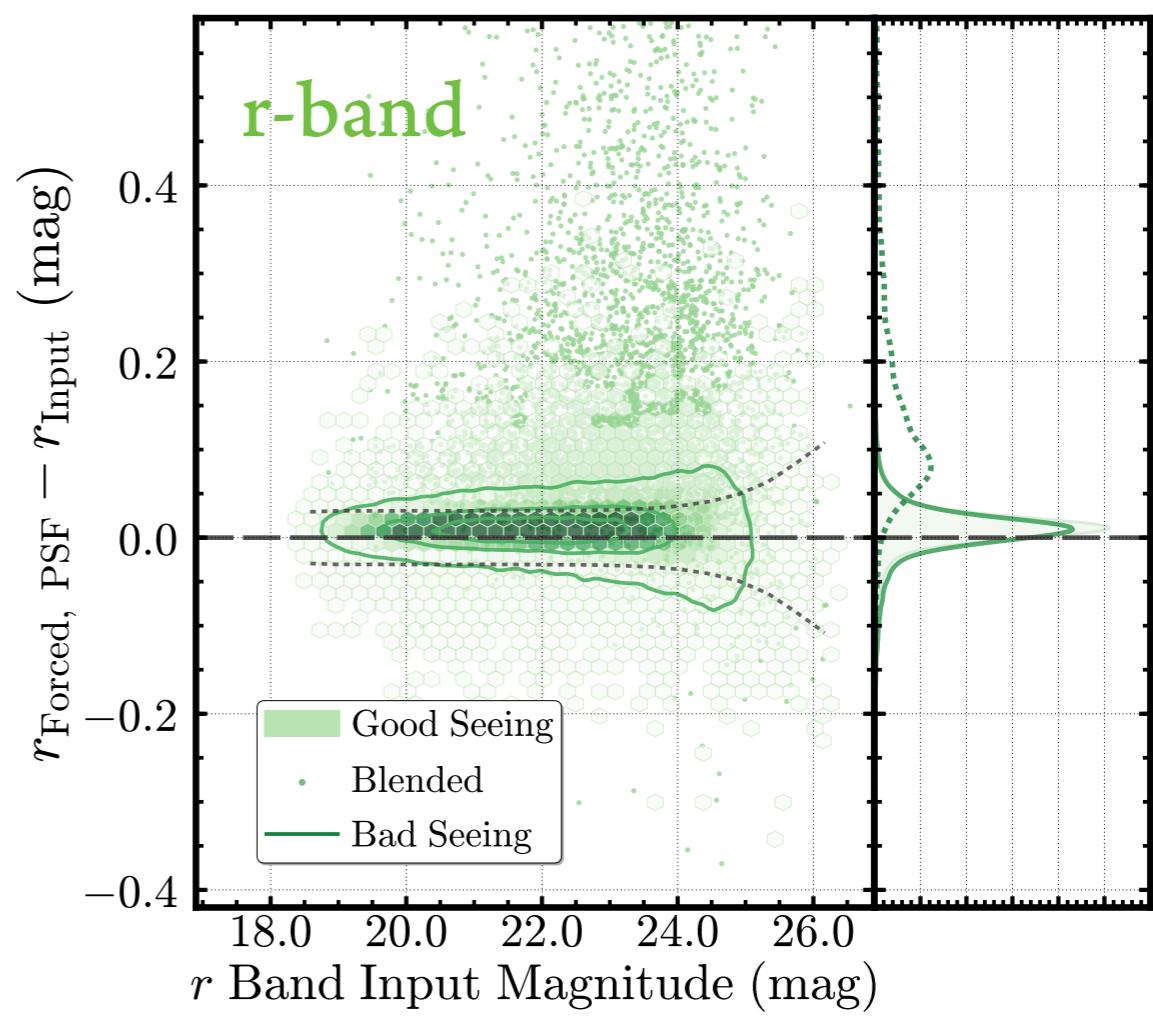
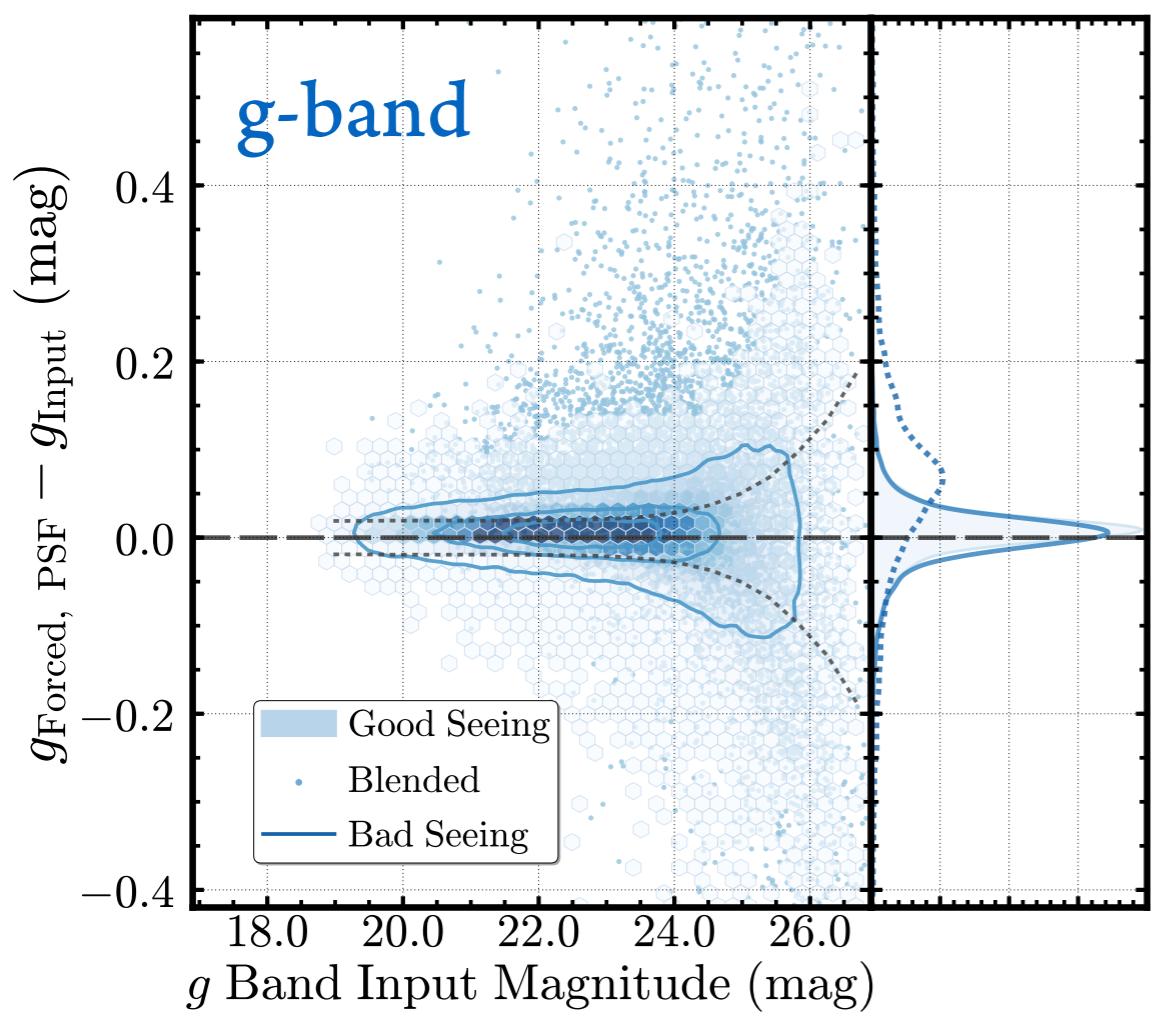
- High blendedness clearly affects accuracy of photometry
- For stellar objects, seeing also clearly changes the S/N distributions (worse seeing leads to lower S/N)





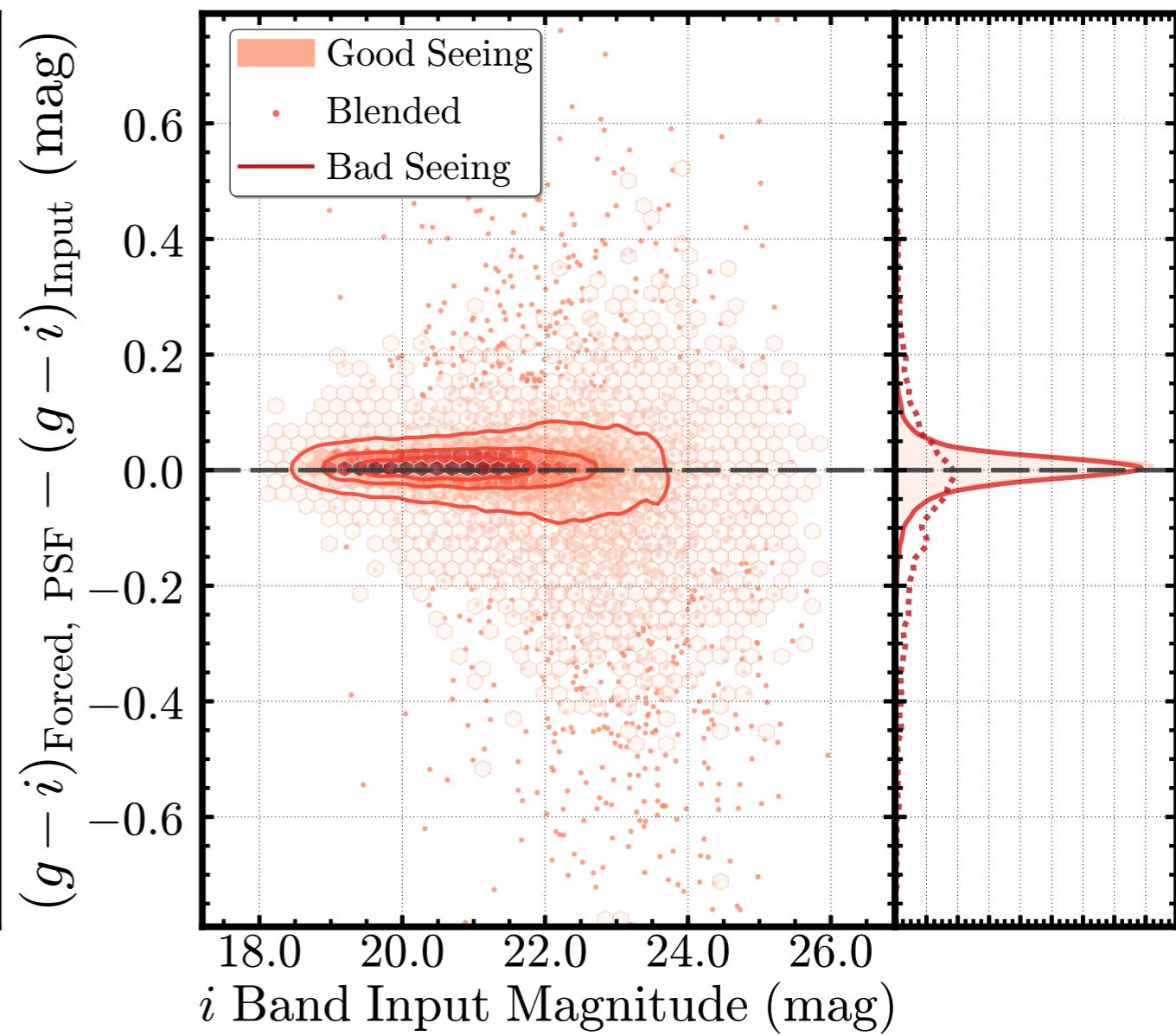
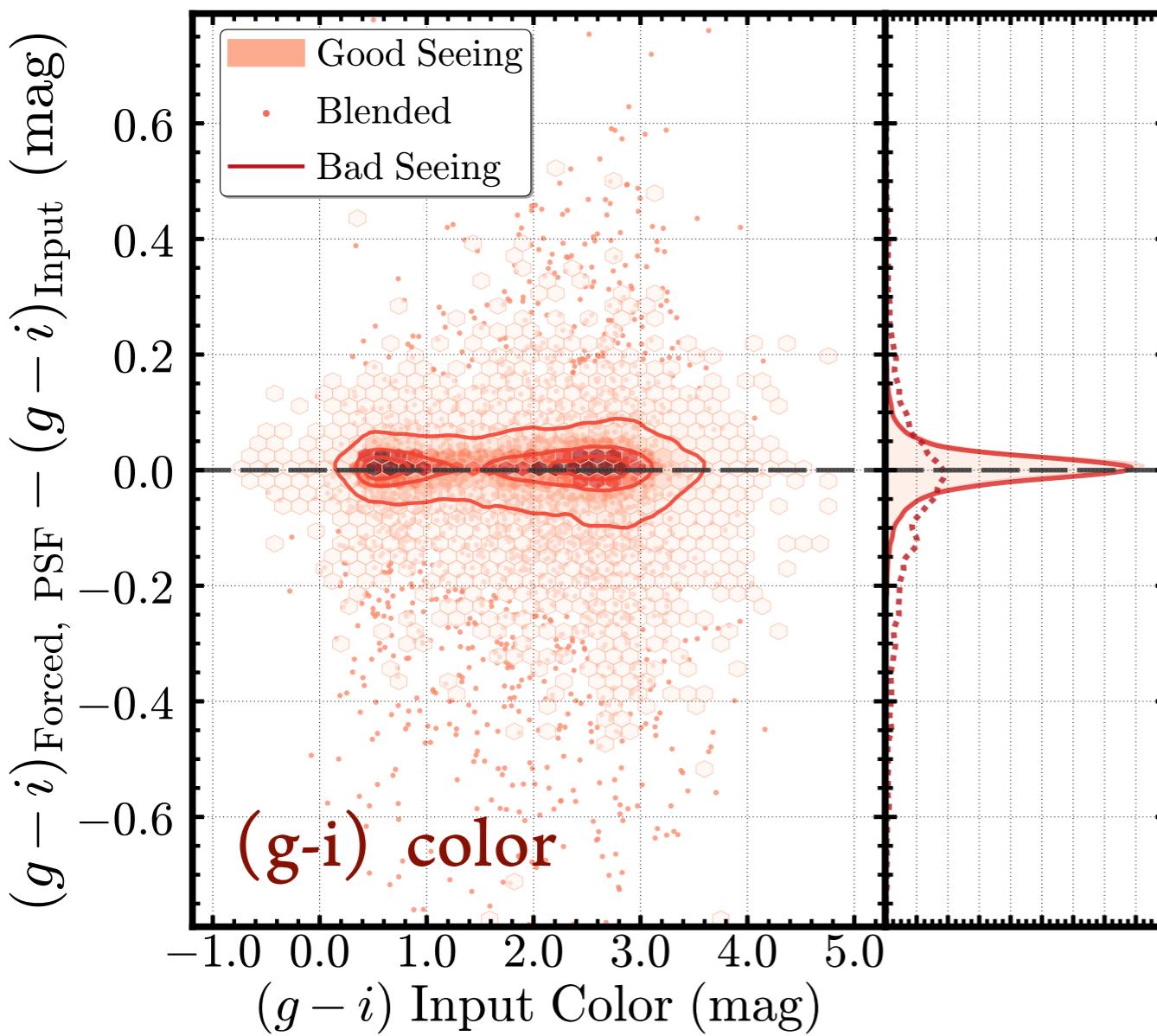
# Uncertainties of PSF Magnitudes





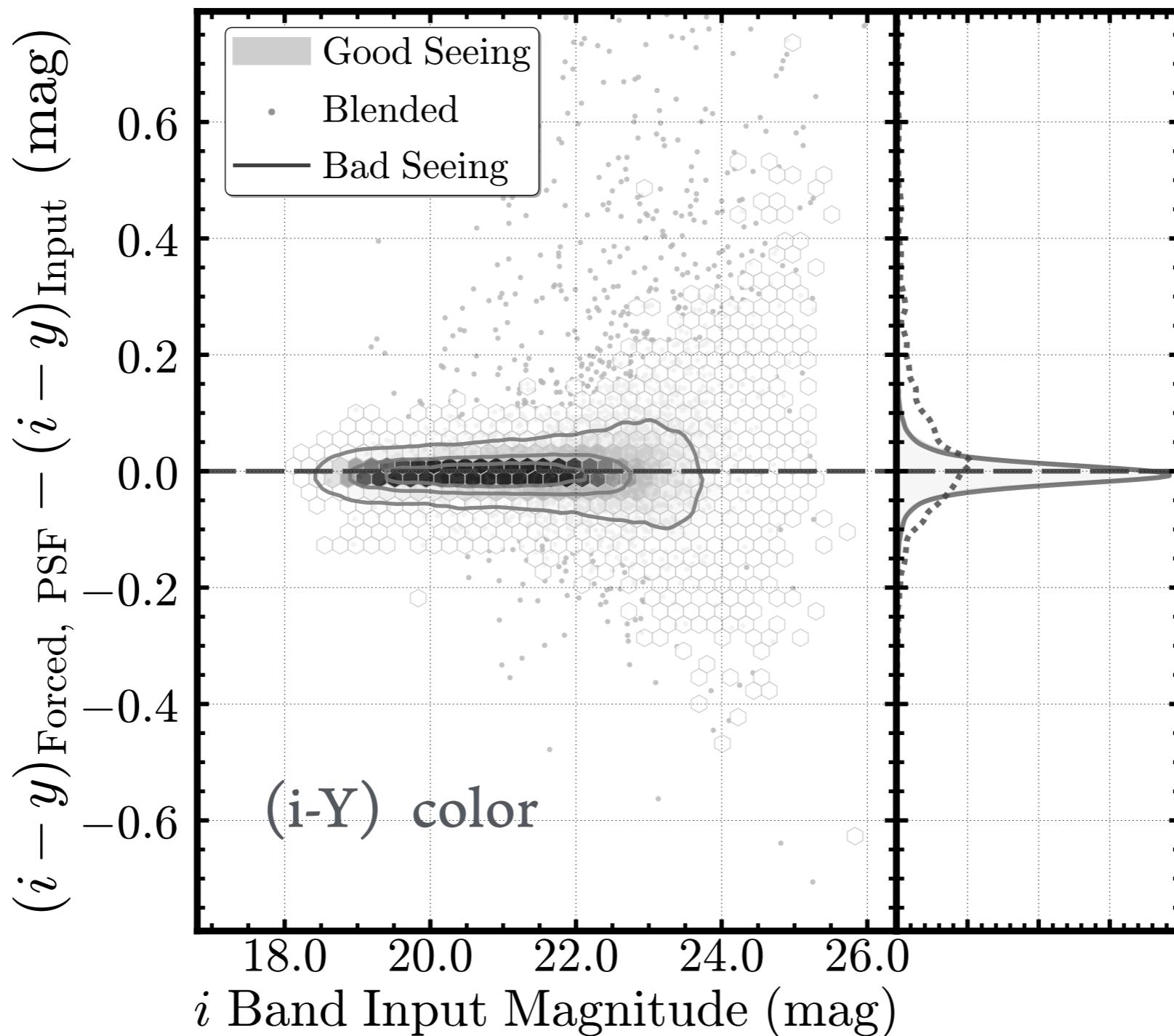
# Uncertainties of PSF Colors

- High blendedness leads to larger scatter, but not clear offset
- Seeing difference does not affect the accuracy of colors a lot



# Uncertainties of PSF Colors

- Other colors have similar behaviours



# Uncertainties of PSF Colors

- Can recover the color-color distributions as well

