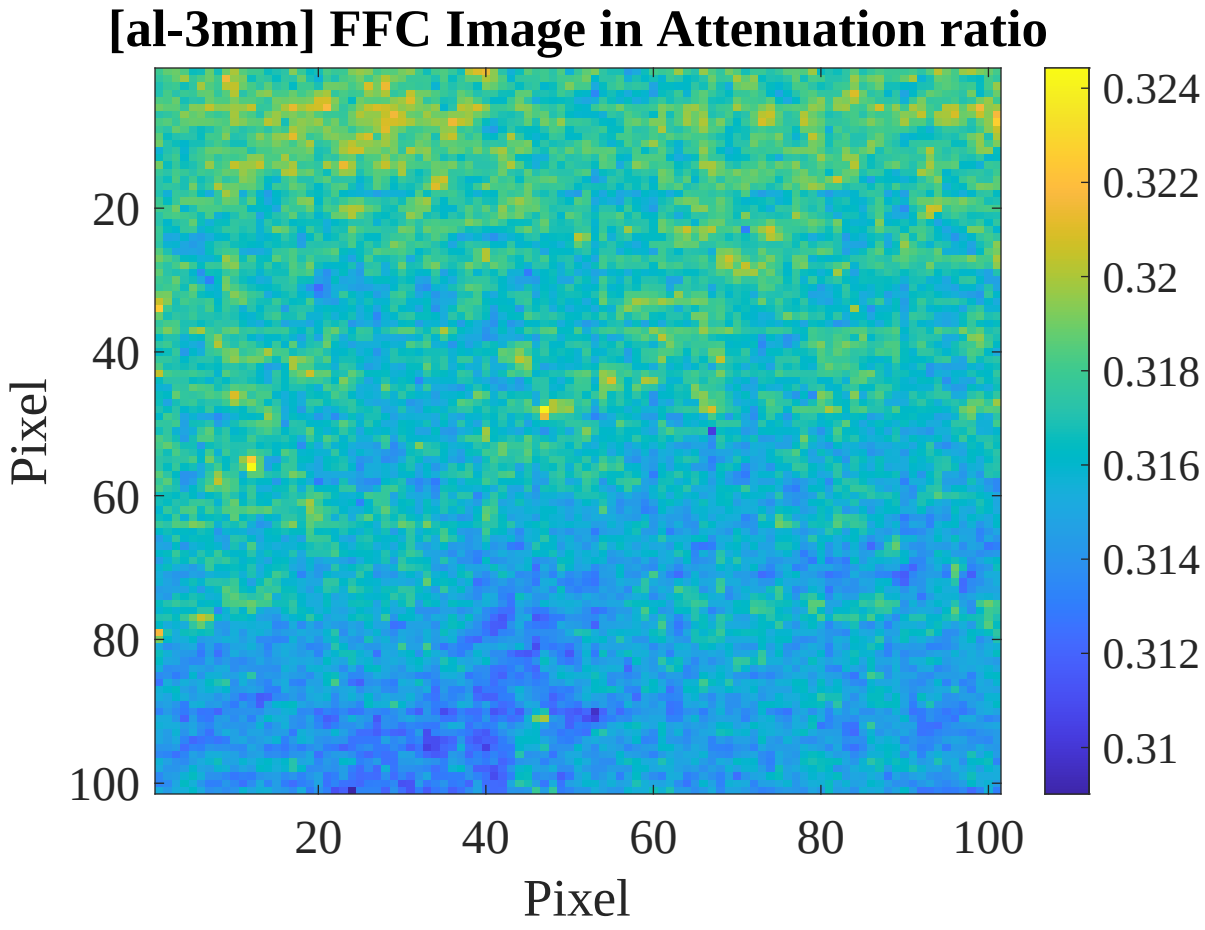
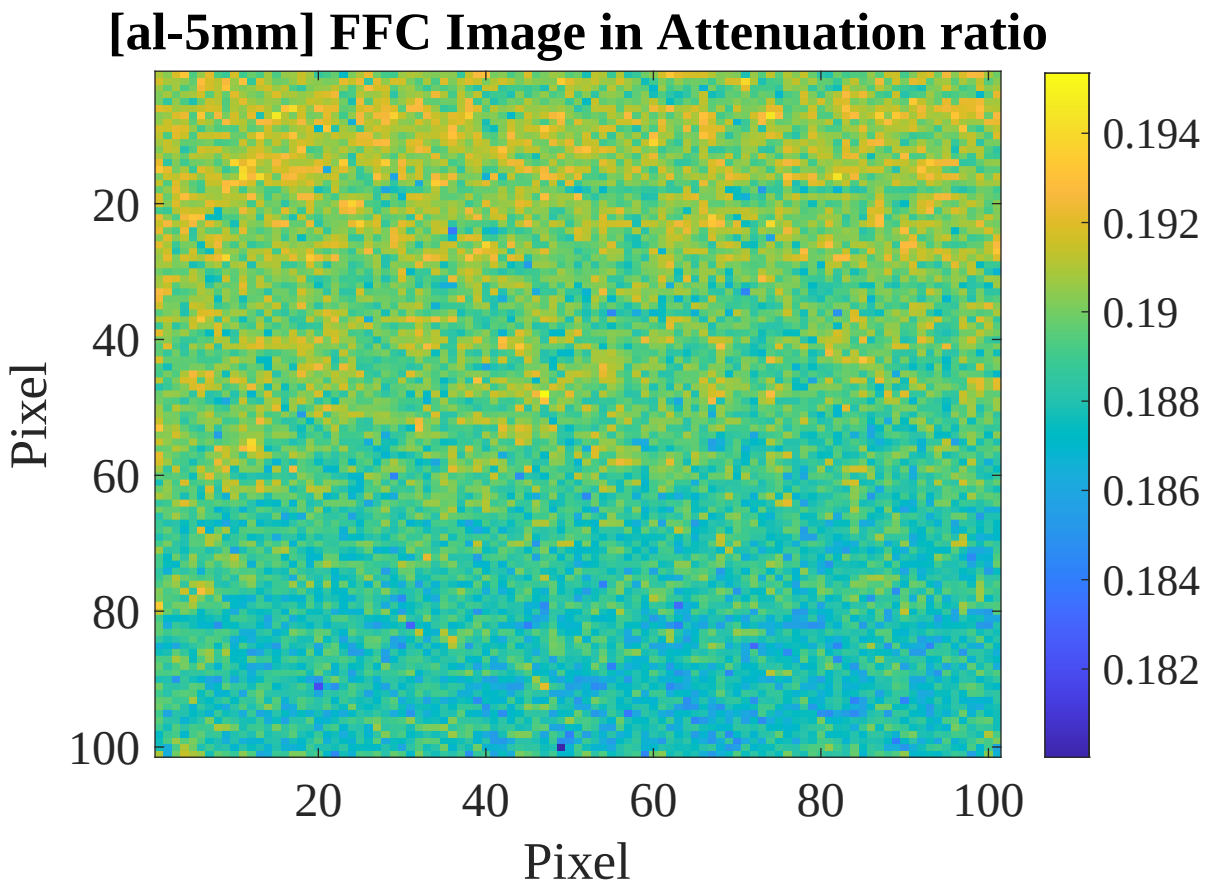
Teledyne X-Ray Detector Characterization for estimation hw capabilies with the aspect of use in CT

26-Dec-2020

Chapter 1. Statistics




[al-5mm] FFC Image in Attenuation ratio
Pixel
20
40
60
80
100
Pixel
20
40
60
80
100
0.194
0.192
0.19
0.188
0.186
0.184
0.182

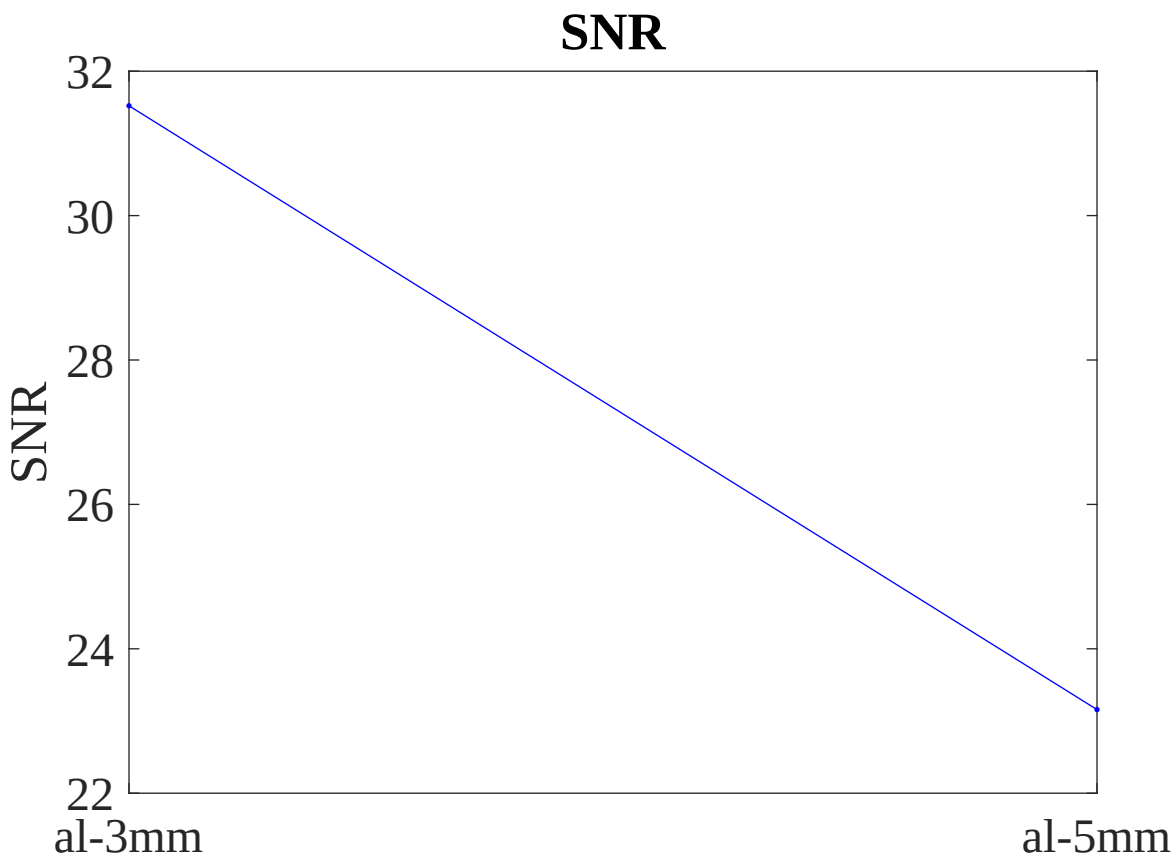


Figure 1.1. SNR is calculated as division of the signal by its deviation. Can be compared with other detectors to estimate relative DQE.

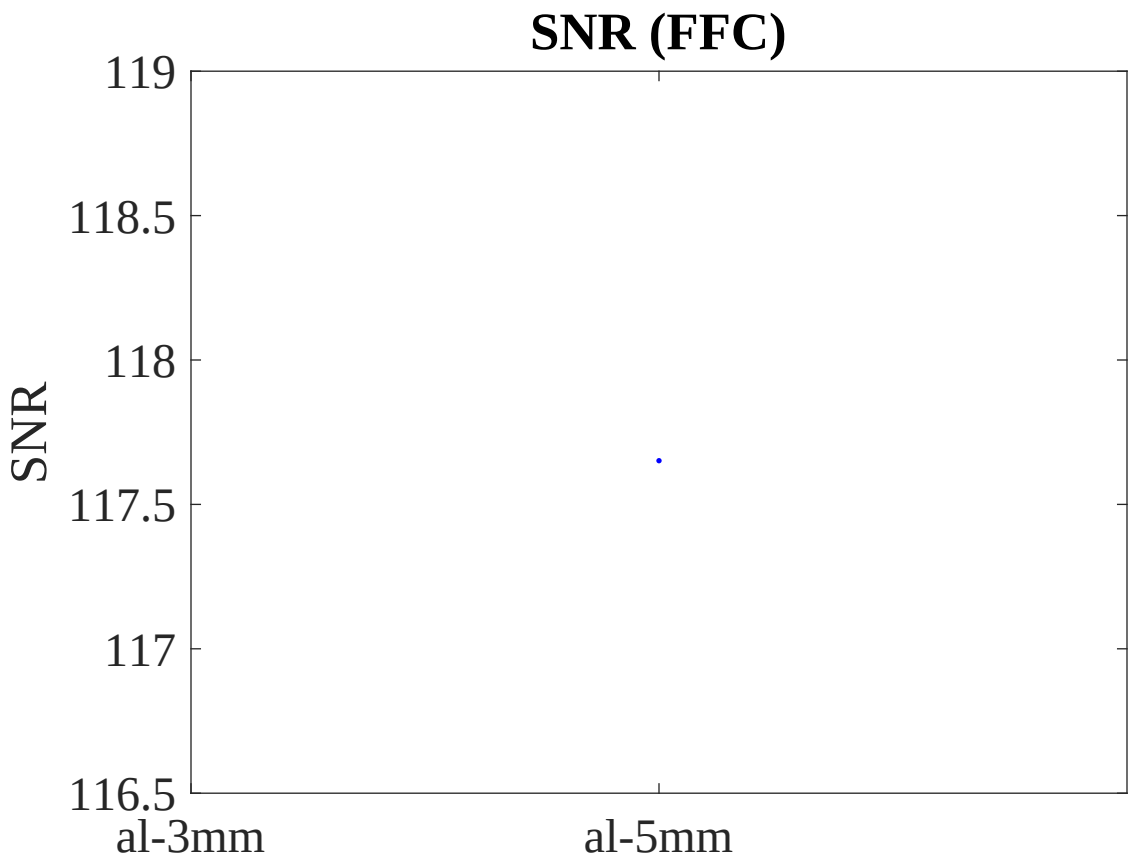


Figure 1.2. One of the most important characteristic for CT. It estimates fundamental detector heterogeneity over pixels. Its impossible to get image with noise less than this characteristic, because averaging doesnt effect on it. The calculation process involves gathering huge statistics such that poisson noise implied not affecting the result. Then STD over pixels is calculated using the same spectrum conditions for them.

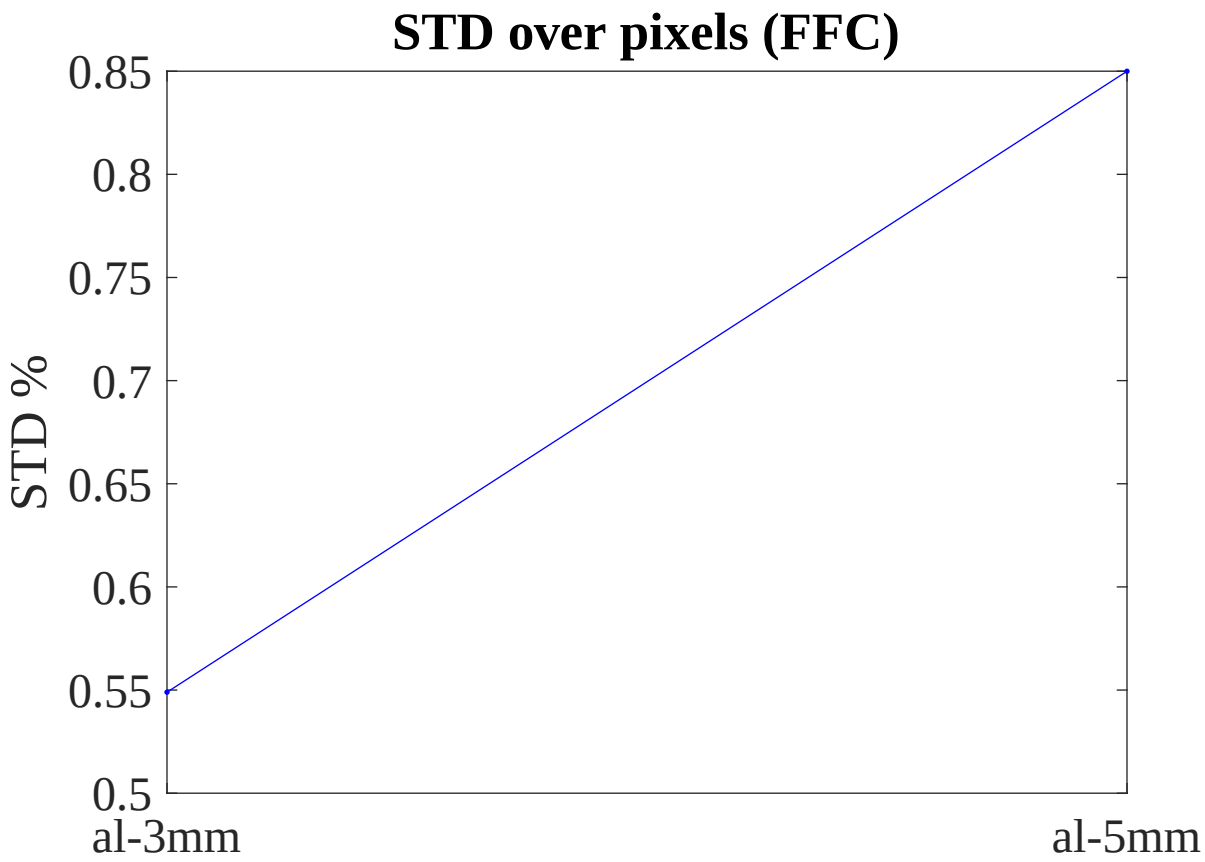


Figure 1.3. The same plot as above, but in %

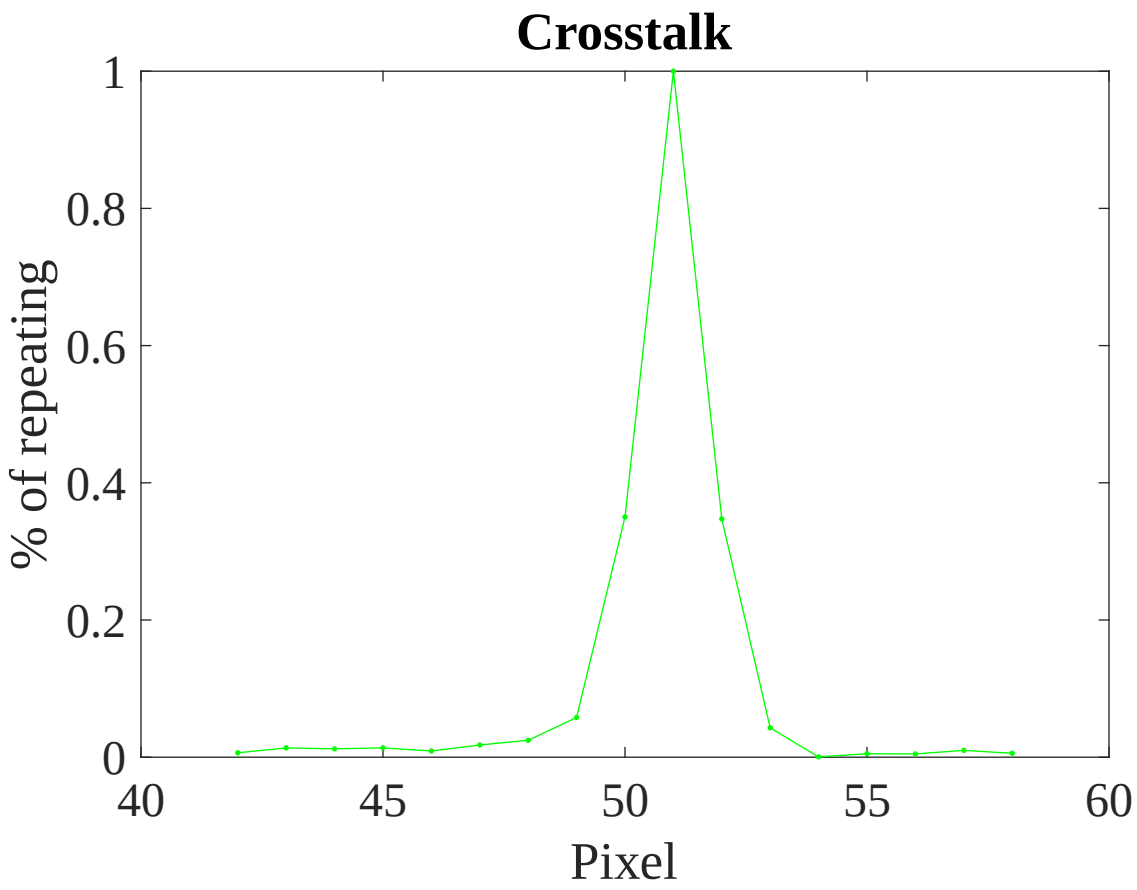


Figure 1.4. Crosstalk is calculated by stat analyse. It effects on binning effeciency as well as on spatial resolution.