



國家同步輻射研究中心  
*National Synchrotron Radiation Research Center*

# Detector Development at TPS

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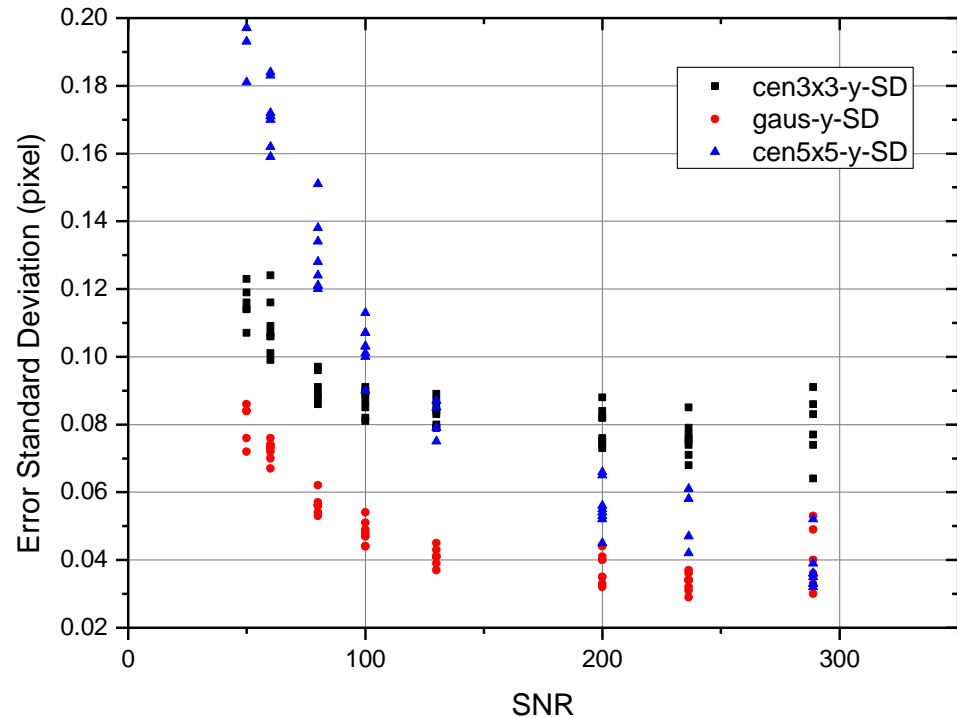
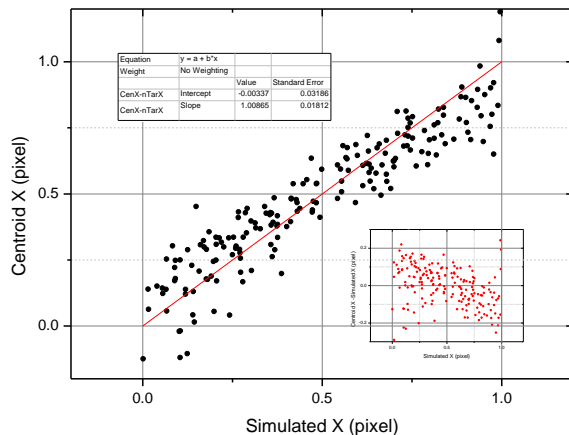


# Single Photon Detection by EMCCD

- e2v EMCCD without anti-reflection coating + Andor camera
- To improve spatial resolution, different algorithms are tried.
  - Gaussian fit 3x3, centroid 3x3 and centroid 5x5
- The position accuracy is dependent on image SNR.
- Gaussian fit algorithm provides the best position estimation.

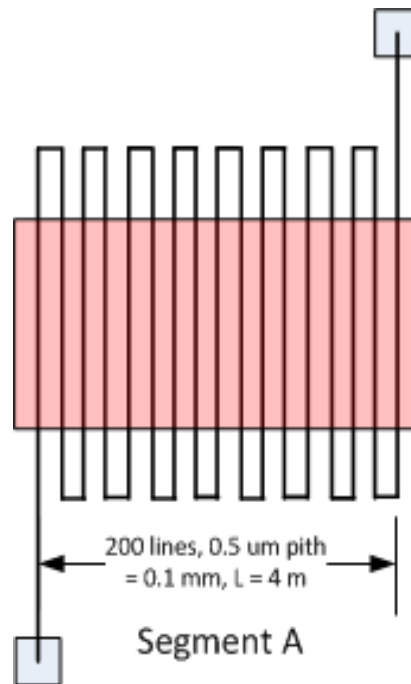
$f(A, x_c, y_c, \sigma_x, \sigma_y) = \text{Fitting Error}$

$$= \frac{\sqrt{\sum_{i=0}^{N_x-1} \sum_{j=0}^{N_y-1} \{f(x_i, y_j) - Ae^{-[\frac{(x_i-x_c)^2}{2\sigma_x^2} + \frac{(y_j-y_c)^2}{2\sigma_y^2}]} \}^2}}{\sum_{i=0}^{N_x-1} \sum_{j=0}^{N_y-1} f(x_i, y_j)}$$



# Specification NSSPD

- Nanowire Superconducting Single Photon Detection (NSSPD)
- Collaboration with AIST, Japan.
- Target
  - Soft X-ray single photon detection with 500 nm spatial resolution.



***Thank you for your attention.***

