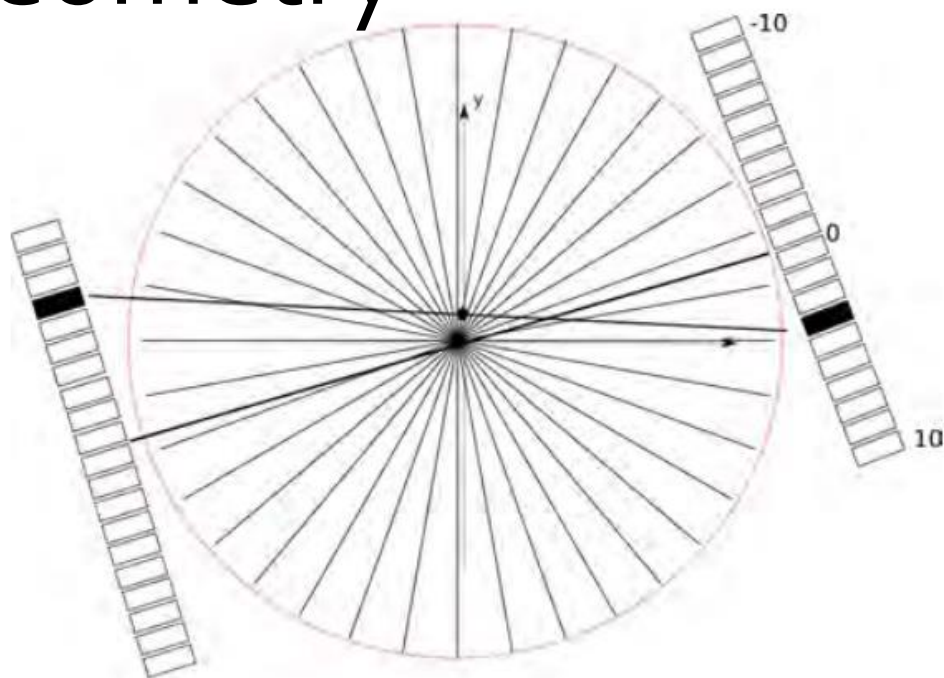


Component based normalization for STIR

Nikos Efthimiou,
University of Hull,
UK

Dual head planar geometry



$$n_{oivj} = b_o^{ax} \cdot b_v^{ax} \cdot g_{ov}^{ax} \cdot \varepsilon_{oi} \cdot \varepsilon_{vj} \cdot g_{x_r,(i,j)}^{tr} \cdot f_{x_r,(i,j)d}^{tr}$$

$$b_o^{ax} = \sqrt{\frac{\frac{1}{C} \sum_{v=1}^C \sum_{i,j} t_{oivj}^{cyl}}{\sum_{i,j} t_{oivj}^{cyl}}}$$

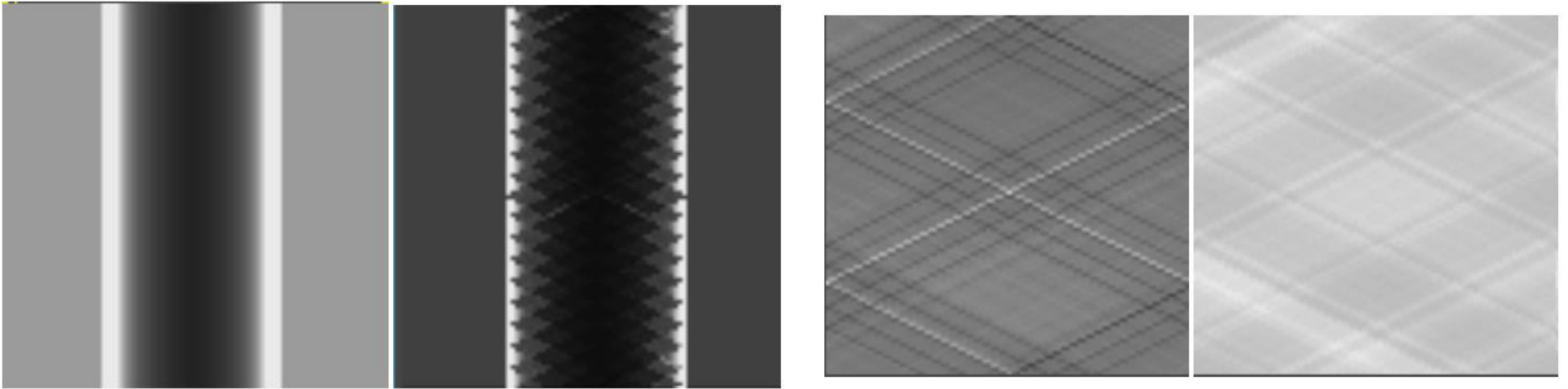
$$g_{ov}^{ax} = \frac{\frac{1}{C^2} \sum_{o',v'=1}^C b_{o'}^{ax} \cdot b_{v'}^{ax} \sum_{i,j} t_{o'iv'j}^{cyl} \cos\theta}{b_o^{ax} \cdot b_v^{ax} \sum_{i,j} t_{oivj}^{cyl} \cos\theta}$$

$$\varepsilon_{oi} = \frac{\frac{1}{R} \sum_{i'=1}^R \sum_{v=1}^{C/2} \sum_j t_{oi'vj}^{pl}}{\sum_{v=1}^M \sum_j t_{oivj}^{pl}}$$

$$g^{tr} = \frac{\frac{1}{U} \sum_{r'} \sum_{ov} \sum_{\phi(i,j)|x_r(i,j)=u'} c_{oivj}^{pl}}{\sum_{uv} \sum_{\phi(i,j)|x_o(i,j)=u} c_{oivj}^{pl}}$$

$$f_{rd}^{tr} = \frac{1}{g^{tr}} \frac{\frac{1}{U} \sum_{r'} \sum_{ov} \sum_{\phi(i,j)|x_r(i,j)=u', \phi(i,j) \bmod D=d} c_{oivj}^{pl}}{\sum_{uv} \sum_{\phi(i,j)|x_o(i,j)=u, \phi(i,j) \bmod D=d} c_{oivj}^{pl}}$$

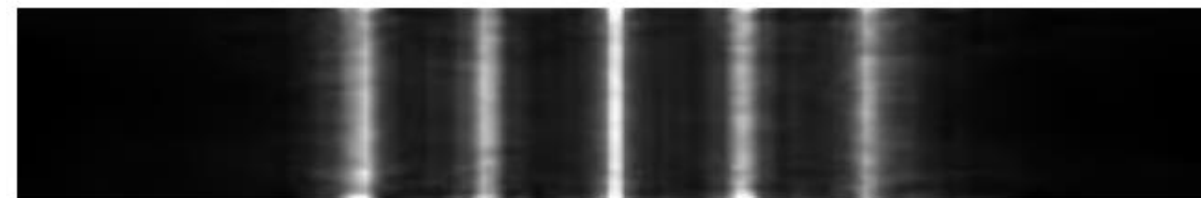
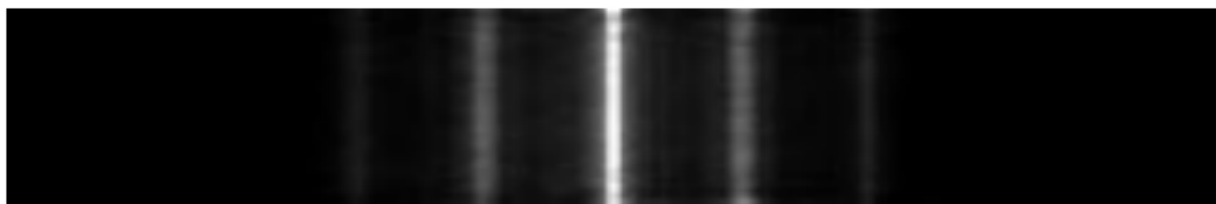
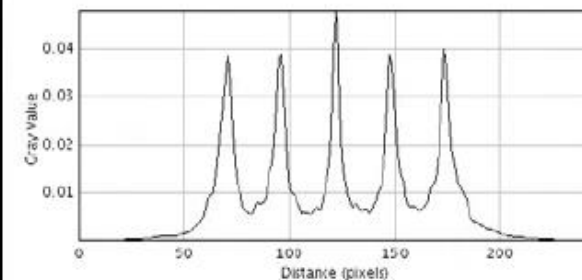
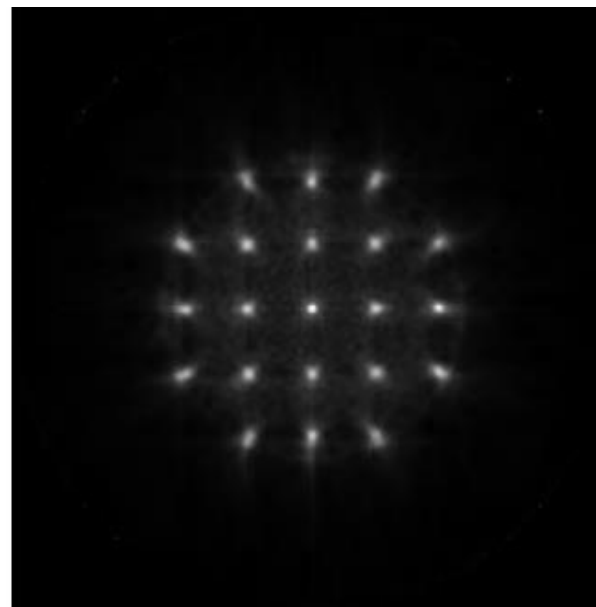
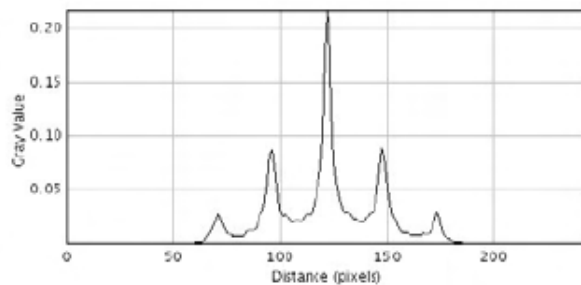
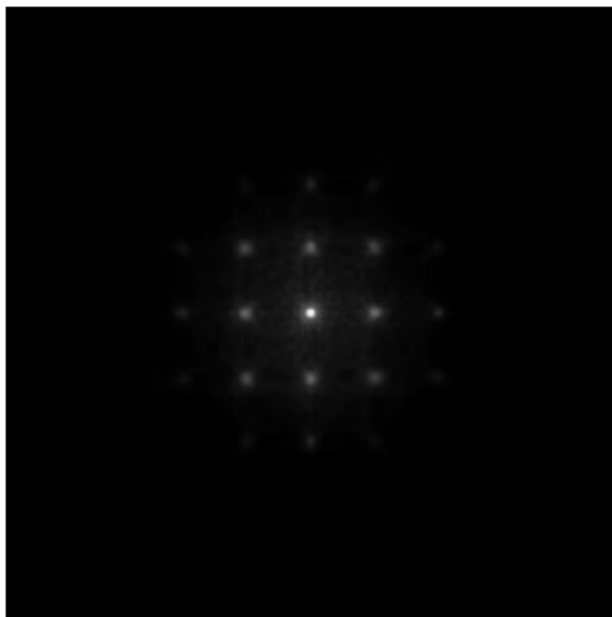
Normalisation sinograms





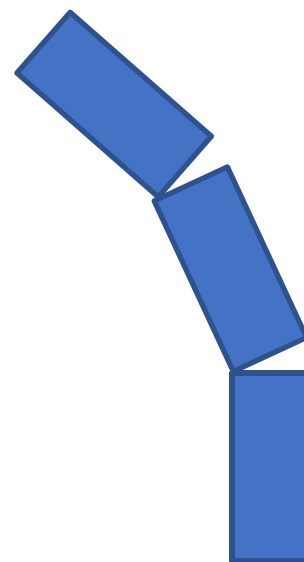
UNIVERSITY
OF HULL

Reconstruction with correction

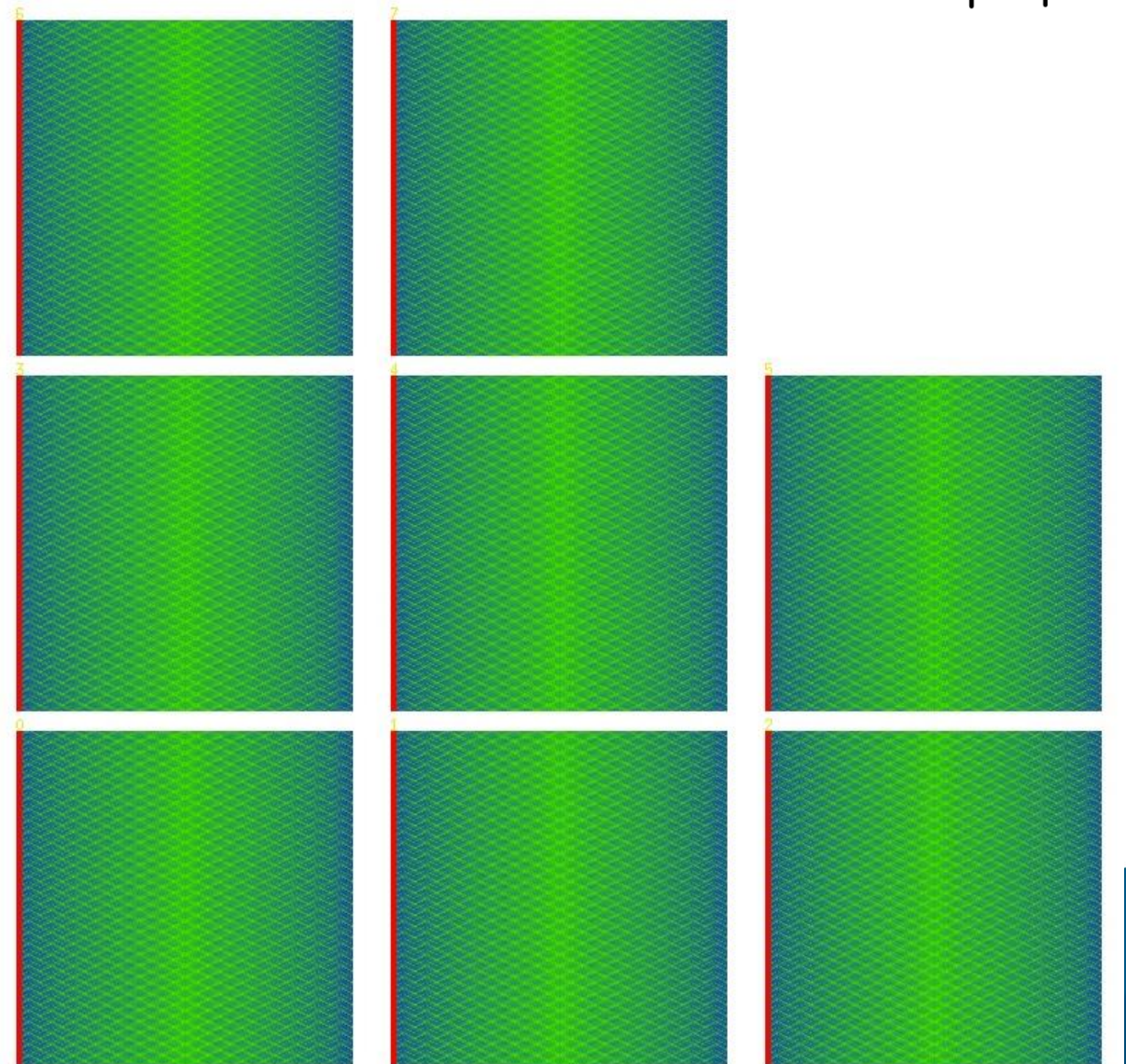


Gianluca Stringhini,
CERN
Dept EP/CMX
Geneva, Switzerland

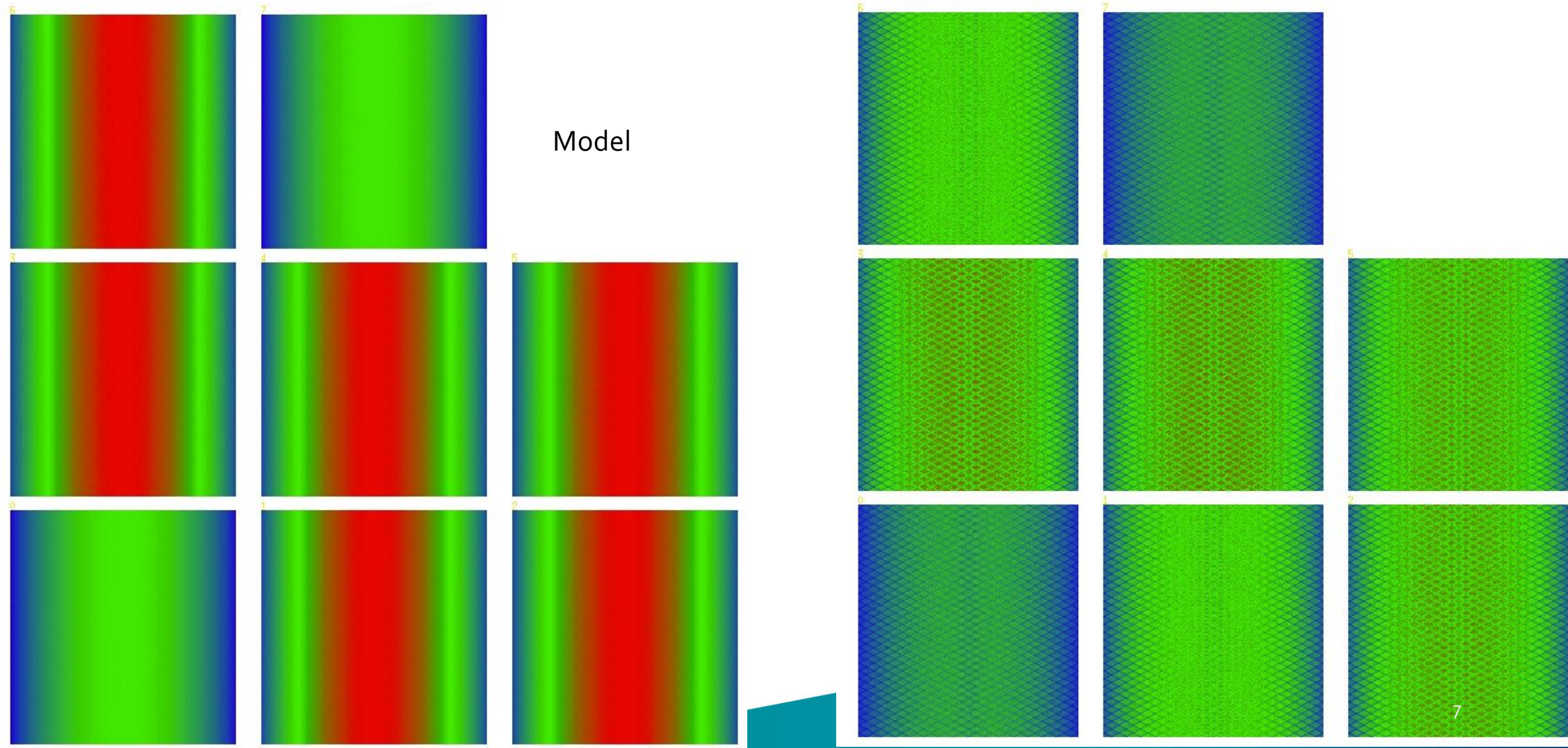
FAST
Fast Advanced Scintillator Timing

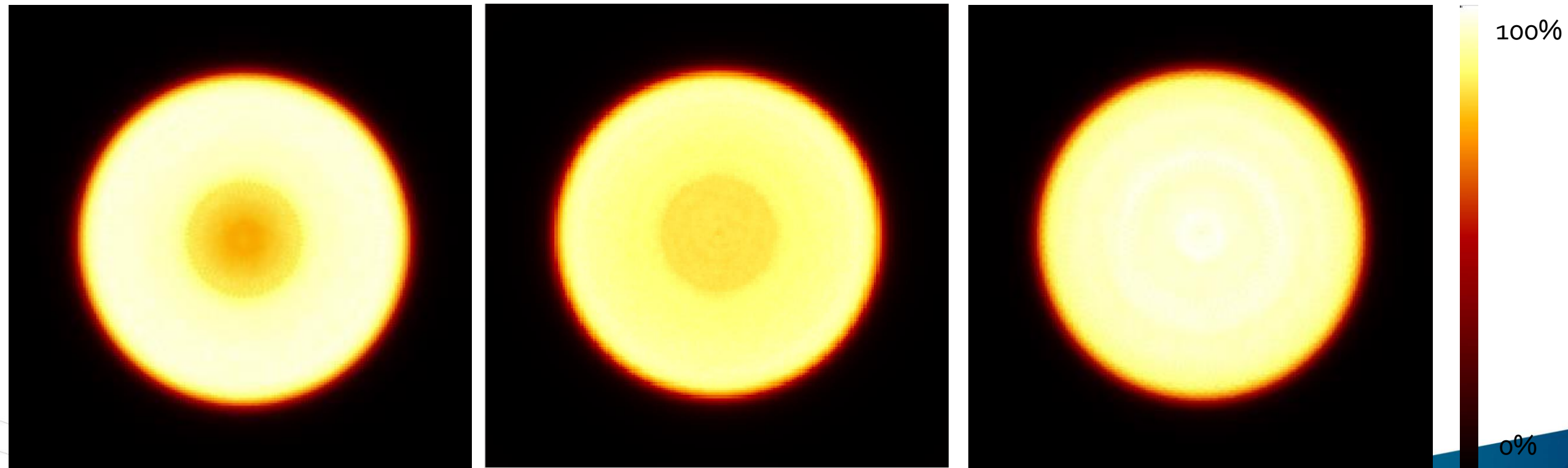


Old Component based sinogram



Model





Raw data

Old Normalization Code

New Normalization Code

Raw data

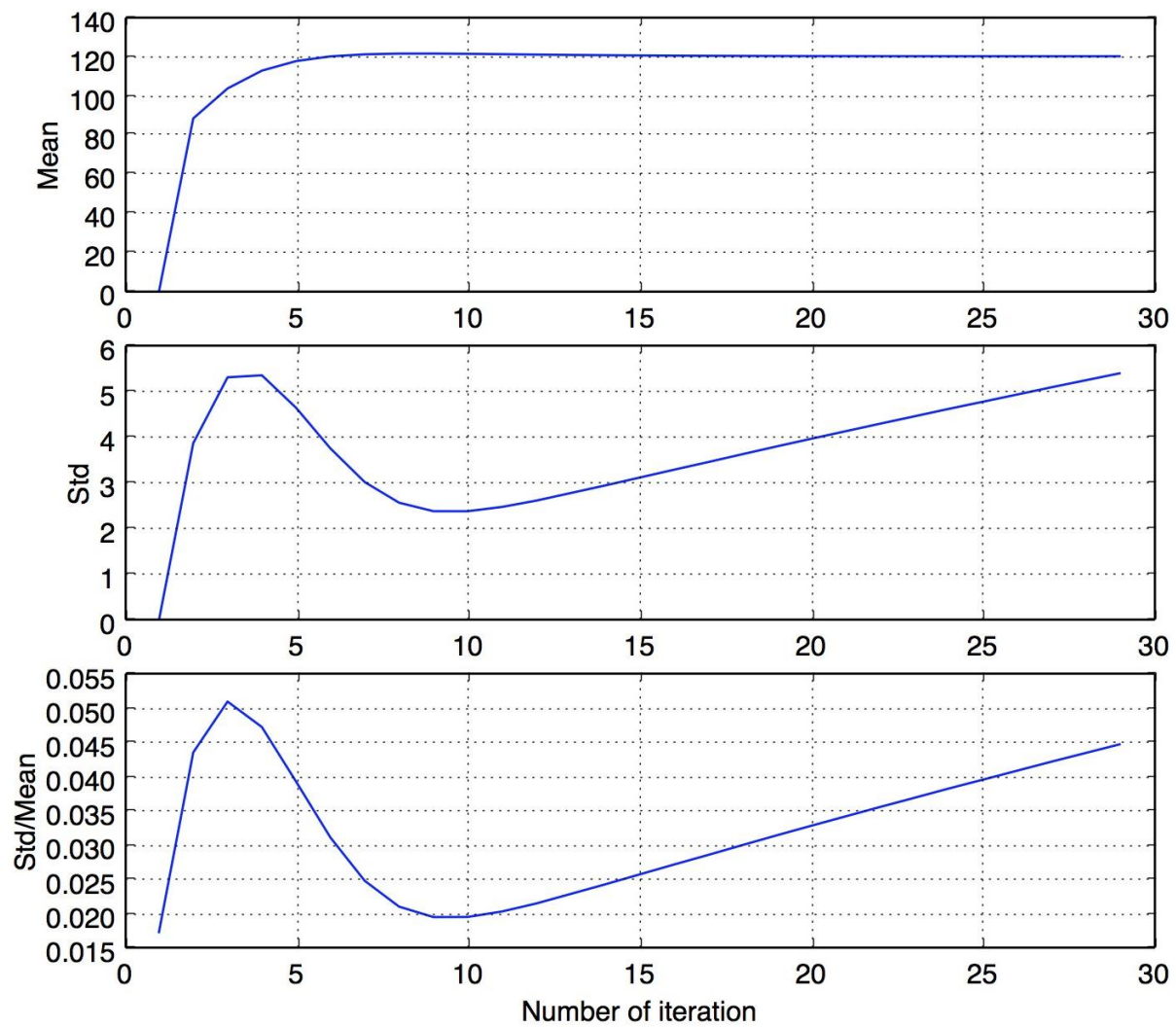


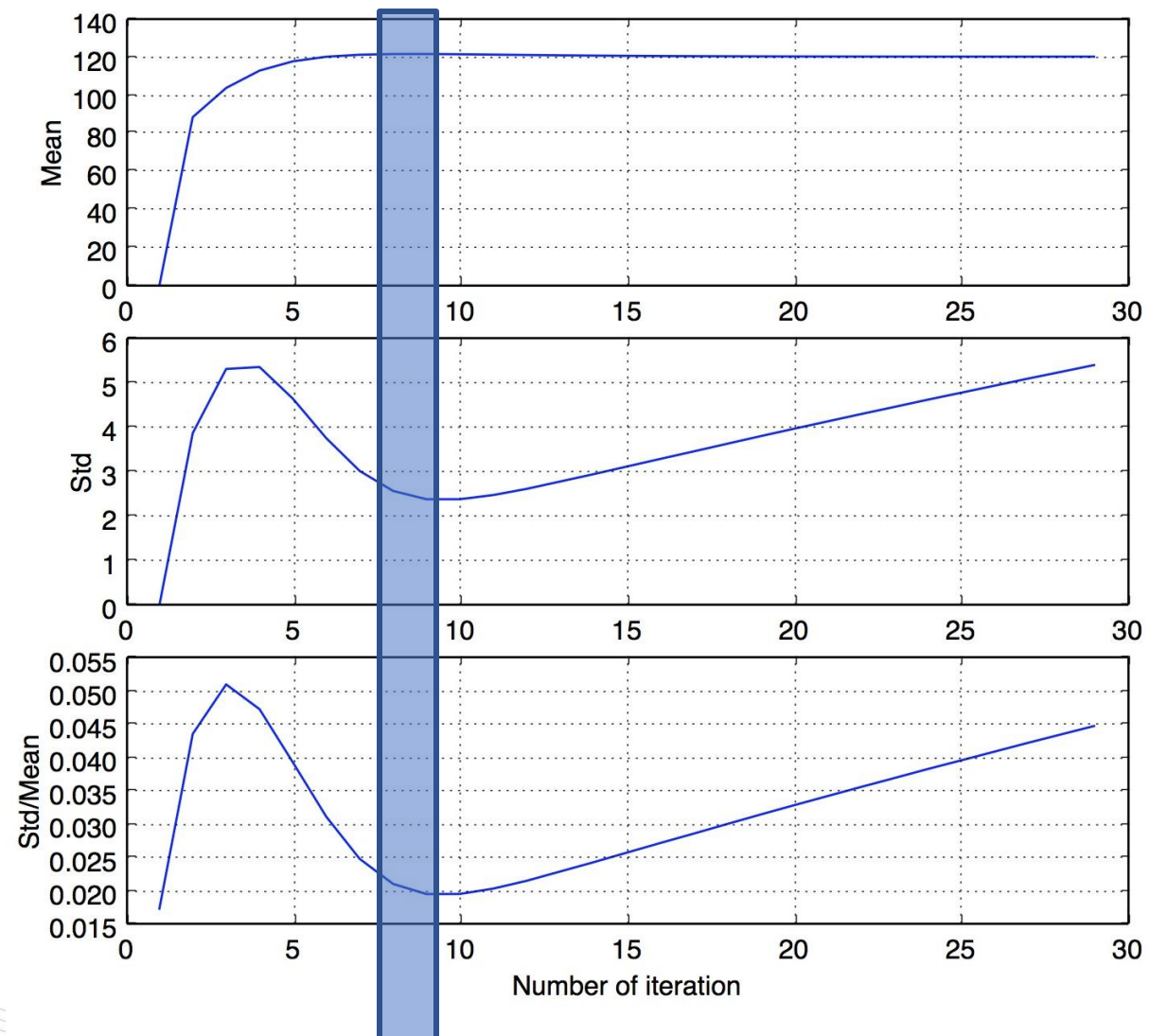
Old Normalization Code

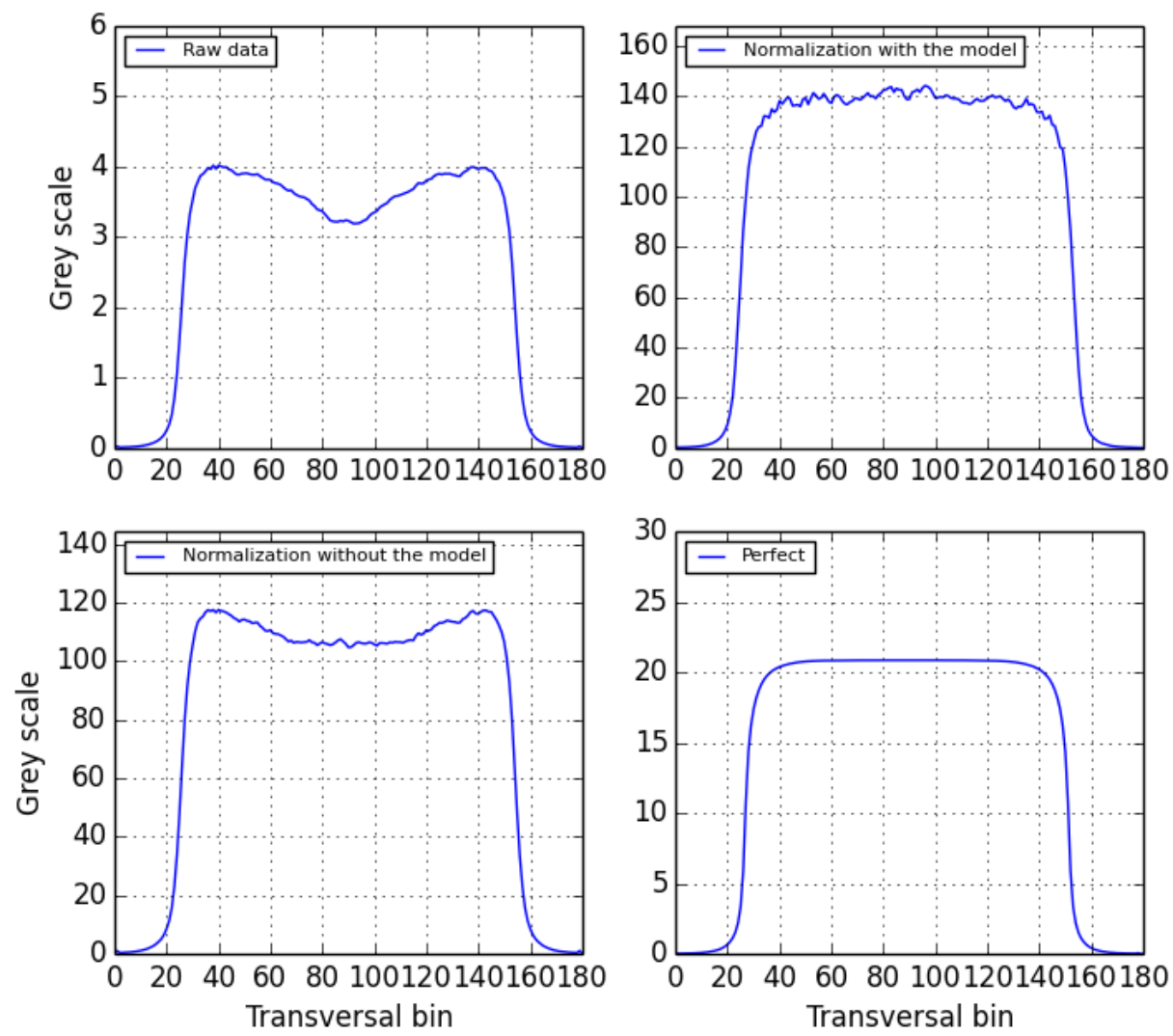


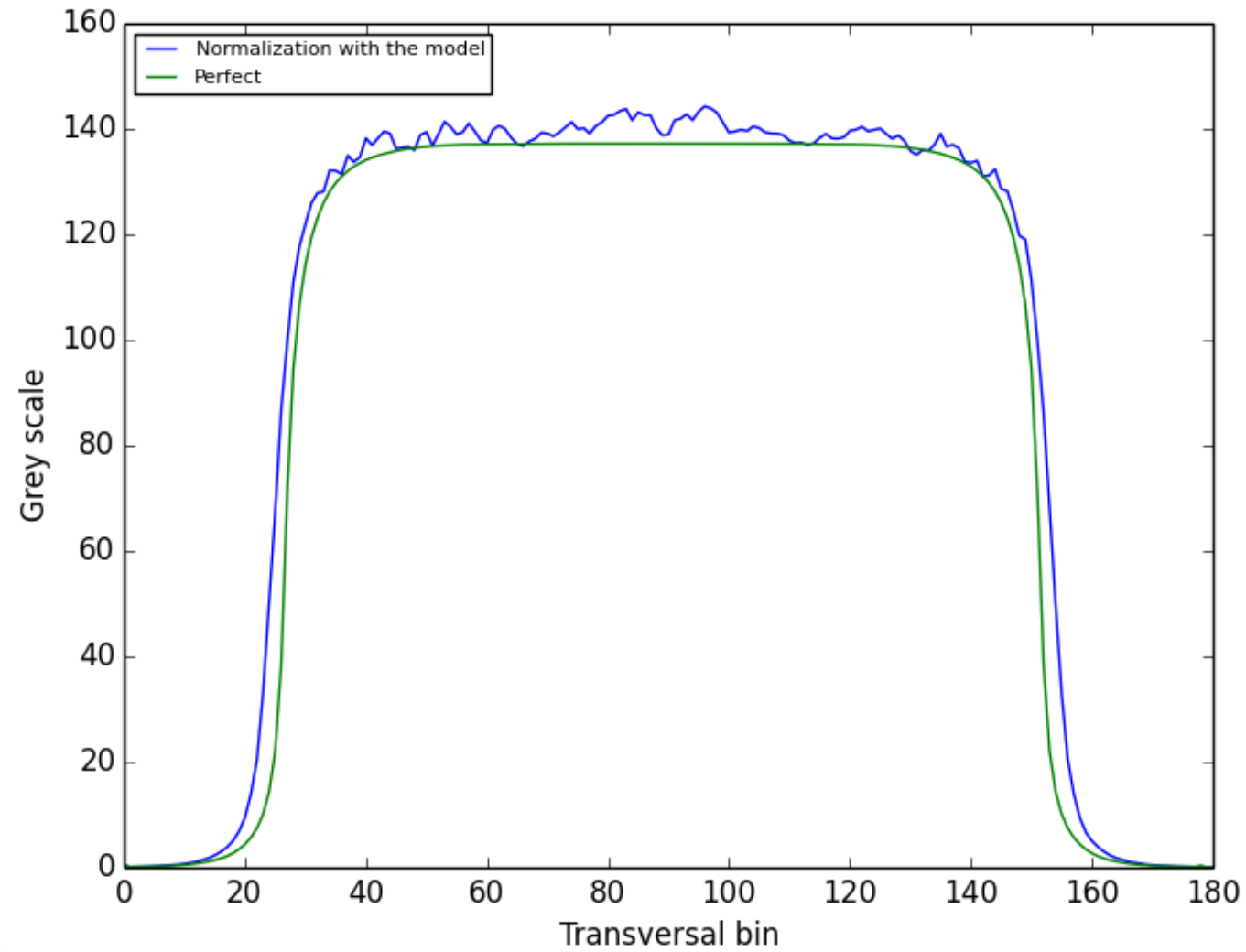
New Normalization Code











Application in full cylindrical PET scanners

