

# **Scatter Correction Based on U-net net work for high enegy x-ray radiography**

**Na Zheng<sup>1</sup>**

<sup>1</sup>third, Institute of Applied Physics and Computational Mathematics, China

In high enegy x-ray radiography the line absorption coefficients or the interface locations of the investigated object can be reconstructed by using the infromation of the radiography image. But because the scattered photons in the image signal will blur or even whelm the radiographies if there are lots of stronh scattng materials in the sample. Hence, it is of great significance to consider the scattered photons and correct the scattering. In this work, we proposed two approaches for scatter corelation based on deep learning, which adopt a U-net convolution neutral network atchitecture, including an indirect method, based on the estimation of the scatter map which is then subtracted from the original image; and a direct method, based on the estimation of final corrected image directly. The total image (direct+scatter) was employed as input in both approaches, while the ground truth was the direct image for the direct method and scatter for the indirect method. The Monte Carlo simulations were preformed to generate the dataset, and a 5-fold cross validation training approch was used because of the small avaiable dataset and in order to ensure our models generalize properly. The preliminary results in simulated data demonstrated the potential of the deep learning methods to evaluation the scatter with an error of around 8%. In future work, we will include investigation other loss function that achieve better spatial resolution, and training with bigger and more diverse datasets to optimize the robust and the generalization of the network.