



Contribution ID: 61

Type: **Poster**

## **A system modification to a single-grid phase-contrast x-ray imaging (PCXI) system for improving image quality**

*Tuesday, 26 June 2018 16:00 (1 hour)*

In this study, we propose a modification to a single-grid phase-contrast x-ray imaging (PCXI) system using a Fourier domain analysis technique to extract absorption, scattering, and differential phase-contrast images. The proposed modification is to rotate the x-ray grid in the image plane to achieve spectral separation between the desired information and the moiré artifact, which is introduced by the superposition of the periodic image of the grid shadow and the periodic sampling by the detector. In addition, we performed some system optimization by adjusting distances between source, object, grid, and detector to further improve image quality. This optimization aimed to increase the spectral spacing between the primary spectrum (lower frequency) and the harmonics of the spectrum (higher frequency) used to extract the various image contrasts. The table-top setup used in the experiment consisted of a focused-linear grid with a 200-lines/inch strip density, a micro-focus x-ray tube with a 55-um focal spot size, and a CMOS flat-panel detector with a 49.5-um pixel size. The x-ray grid was rotated at 27.8 degrees with respect to the detector and the sample was placed as close as possible to the x-ray tube. Our results indicated that the proposed method effectively eliminated the PCXI artifacts, thus improving image quality.

**Primary author:** Prof. CHO, H. S. (Yonsei University)

**Co-authors:** Ms PARK, S. Y. (Yonsei University); Ms PARK, J. E. (Yonsei University)

**Presenter:** Prof. CHO, H. S. (Yonsei University)

**Session Classification:** Poster session