

Track 9

3008

Alignment of a Fixed Carbon-Interspaced Grid for the Removal of Moire Pattern in Digital Radiography

Jai-Woong Yoon¹ Do-Il Kim¹, Young-Guk Park², Nag-Kun Chung², Bo-Young Choe¹,
Tae-Suk Suh¹, and Hyoung-Koo Lee¹

¹ Department of Biomedical Engineering, College of Medicine, The Catholic University of
Korea, ² Jungwon Precision Ind. Co.

tini75@hanafos.com

A moire pattern appeared in digital radiography with the use of a fixed type of antiscatter grid was investigated, and a new mechanical alignment method to remove the moire pattern was proposed. A carbon-interspaced grid, which has a higher uniformity in grid line frequency than in conventional lead strip grids, was processed to have the line frequency of 185 line pairs/inch a little bit higher than the DR sampling frequency. Grid images were obtained from the DR detector made of amorphous selenium with the pixel pitch of 139 micron. The detector underneath of the X-ray grid was translated and rotated with the help of a micro-controlled jig. A height of the grid from the detector was adjusted by 4 micrometers to magnify the shades of the grid lines at the detector pixel and, hence, to exactly match with the sampling frequency of the DR detector. The angular displacement of the detector caused a frequency difference to represent a higher frequency of moire. The horizontal translation did not change the frequency of moire but only its phases. As the frequency difference between the grid and DR was decreased, the low-frequency patterns were found, and finally disappeared at the complete matching. High straightness and uniformity of grid lines of the carbon-interspaced grid and the micro-controlled alignment method enable matching the frequencies to remove the moire patterns without a software filtering and a moving grid.

Keywords : Moire Pattern, Digital Radiography, Antiscatter Grid