

## **Precision fabrication of two-dimensional anti-scatter grids**

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### **ABSTRACT**

Creatv MicroTech is developing two-dimensional, air-core, anti-scatter grids that have the potential to significantly reduce scatter-to-primary ratio and increase primary transmission in mammography. The fabrication method uses x-ray lithography and electroplating, which allows the fabrication of high aspect ratio metal parts. Two unfocused nickel grids were fabricated, one 1.5 cm x 1.5 cm and the other 1.44 cm x 1.44 cm. The grids have 20 micron thick walls and a period of 300 microns. Monte Carlo simulations were performed to predict their performance. The x-ray source was a 30 kVp Mo-anode spectrum and 30 microns of added Mo filtration. Preliminary calculations for a 2 mm-high grid and a 4 cm lucite phantom indicate that a scatter-to-primary ratio less than 3% can be achieved even at 3 cm from the center of the grid. Experiments to test the performance of the grids have been conducted at FDA using a Mo target, 30 micron Mo filter at 30 kVp and a 4 cm thick lucite phantom. A germanium detector was used. Data from a mammographic grid made by Smit Röntgen was taken as a reference. These Ni grids with grid ratios of 6.4 and 7.1 reduce scatter and increase primary transmission compared to the conventional reference grid. This fabrication method is capable of producing focused grids. The demonstration of larger, focused grids is the next step.

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