AbstractID: 7108 Title: The Effect of 2X Zoom on Virtual Cursor Depth Measurements in Stereomammography

We are developing virtual 3-D cursors for measuring depths in digital stereomammograms. Our previous studies showed viewing the images at a 2X-zoom factor did not improve the measurement accuracy. Those studies employed 50-micron pixel images created with a Fischer biopsy unit. We performed a similar study with 100-micron pixel images created with a GE Senographe 2000D digital mammography unit. A phantom containing 25 low contrast fibrils at depths ranging from 1 to 11 mm was imaged. Left and right eye images were generated at stereo shift angles of +/- 2.5^{o} and 5^{o}. The images were displayed in normal and 2X zoom mode. Observers viewed the images with stereo glasses and adjusted the positions of a cross-shaped virtual cursor to best match the perceived location of each fibril. For a trained observer, the standard errors of the estimates (SEEs) of the least-square fits to the measured vs. true depths were 0.59, 0.50, 0.31, and 0.19-mm for the 2.5^{o}, 2.5^{o} zoom, 5^{o}, and 5^{o} zoom images, respectively. The corresponding RMS errors were 0.59, 0.94, 0.39, and 0.40-mm. Use of the 5^{o} stereo angle improved the depth measurement accuracy (RMS error) by 34%. Although zooming the images did not improve depth measurement accuracy, the stereo effect was more readily visualized. This was more apparent than in the 50-micron pixel case. Also, the consistencies of the measurements as determined by the SEEs were improved with zooming. Results for additional observers and for alternative depth calibration methods will be presented.