AbstractID: 9644 Title: Automated Stereo Spot Mammography: A Comparison of Spot Imaging Regions Selected by Radiologists and a Computer

We are developing an automated stereo spot mammography technique for improved imaging of suspicious dense regions within digital mammograms. A critical element in this technique is the automated detection of regions for spot imaging. Previously, we presented the results of a preliminary observer study comparing regions selected in 800-micron digitized mammograms by different radiologists. We have since modified our display program to show images at higher resolution (200 and 400-micron) and to include a comparison with regions selected by a computer using an in-house developed CAD mass detection program. The new graphical-user-interface was employed by 4 radiologists to select regions in 200 digitized mammograms. Both the radiologist and the computer could select up to 3 regions in each image. We quantified the agreement between the regions selected by the radiologist and the computer by an overlap index, which was the ratio of the intersection of a pair of areas selected by the radiologist and the computer to the area selected by the computer in each mammogram. The selected regions were exhaustively paired and their overlap indices calculated. The overlap indices in each image were then ordered from largest to smallest. The averages of the largest indices in the 200 images for the 4 radiologist-to-computer comparisons ranged from 74% to 95%. The averages for the second largest indices ranged from 18% to 73%. The agreement of the selected spot regions among radiologists and the computer will be discussed in detail. Images illustrating the comparisons and additional statistics will be presented.