

AbstractID: 1363 Title: A contrast-detail phantom study to compare a slot scanning digital mammography system with an aSi/CsI flat-panel based system

Objective: To compare the low contrast performance of an aSi/CsI flat-panel based and a slot scanning CCD-based digital mammography systems by measuring the contrast-detail curves and the correct observation ratios.

Method: Images of a CDMAM type 3.4 phantom were acquired with a flat-panel based (GE) digital mammography system and slot scanning CCD-based (Fisher) digital mammography systems at various Mean Glandular Dose (MGD) levels, 0.60, 0.87, 1.24, and 1.74 (photo-timed on a screen/film mammography system) mGy. All images were displayed on workstations and reviewed by seven readers. Each reader was asked to detect disks with various disk thicknesses and diameters and identify their locations. The correct detection probability was computed as a function of the contrast level for each different disk diameter. The minimum detectable contrast level was then determined using a threshold of 50% or 75% and plotted as a function of the disk diameter to form the contrast-detail curve for each different system-dose combination. In addition, the correct observation ratio (COR) was computed.

Results: Contrast-detail curves for 1.24 or 1.74 mGy seemed to indicate that Fisher images performed slightly better than GE images. Those for lower doses, probably due to larger fluctuations, did not show clear performance differences between Fisher and GE images. CORs at 0.60, 0.87, 1.24, and 1.74 mGy were computed to be 0.338, 0.374, 0.444, 0.463, respectively, for Fisher images. They were slightly higher than 0.315, 0.369, 0.42, 0.453, respectively, for GE images. However, the differences were not found to be statistically significant.