

Dual-energy Digital Mammography: Preliminary Report

H. Hastings (Hofstra U.), J. Hastings, Z. Zhong (NSLS)

Abstract No. Hast9966

Beamline(s): **X15A**

Introduction: The use of dual-energy digital imaging has been suggested as an approach to improve x-ray mammography. The working hypothesis is that x-ray absorption in the breast is due to "tissue" (largely water) and calcium. Under this hypothesis, x-ray images formed at different two energies might be combined (a weighted subtraction) to cancel out fluctuations in tissue density and thus enhance detection of calcifications. This approach might be limited by increases in the relative magnitude of background fluctuations ("noise") due to above subtraction process.

Methods and Materials: We used the NSLS to obtain digital images of a compressed breast phantom (ca. 4 cm thick) with additional calcifications from a tissue mimicking phantom at a variety of x-ray energies from 18 keV to 50 keV. We have begun to analyze these images to design additional experiments in order to evaluate the potential of dual-energy x-ray mammography.

Conclusions: Further experimentation should be conducted.

Acknowledgments: One of the authors was partially supported by the Rosalyn S. Yalow Foundation for Medical Research.