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Assessment of the image contrast improvement and dose reduction in mammography with synchrotron radiation compared to standard units

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Abstract. An objective method was used to evaluate image quality and dose in mammography with synchrotron radiation and to compare them to standard units. It was performed systematically in the energy range of interest for mammography through the evaluation of the contrast and through the measurement of the mean glandular dose. Synchrotron radiation measurements were performed at the ESRF and a slit was placed between the test object and the screen-film system in order to reduce scatter. The conventional films were obtained on mammography units with an anti-scatter grid. In a recent paper, it was shown that the use of synchrotron radiation leads to a noticeable improvement of the image quality - dose relationship. The reason of that enhancement is partly due to the monochromaticity of the synchrotron beam and partly due to the use of a slit instead of a grid. The dose reduction with synchrotron radiation can be attributed to a better X-ray total transmission of the slit and the contrast improvement is due to the monochromaticity of the synchrotron beam.

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