It was demonstrated in a previous paper (1) that Selenium direct X-ray detectors have interesting features: high energy absorption and DQE, unlimited pre-sample spatial resolution, high sensitivity, low lag and no ghosting. Their coplanar deposition process exempt of any photolithography requirement and their insensitivity to moisture make them ideal candidates for low-cost digital radiography detectors.

The objective of this paper is to report on the performance of Selenium-based detectors designed for mammography applications. These detectors associate a Selenium multi-layer structure, specific TFT active area, scanning and read-out electronics.

The paper will describe the performance of both detectors built respectively for interventional mammography and screening mammography.

The interventional mammography detector operates at 10 frames/second. It contains 1024 x 1024 pixels of 85 micron pitch covering an active area of 8.7 x 8.7 cm^2.

The screening mammography detector has been built by extending the area to 23.9 x 17.4 cm^2. It contains 2816 x 2048 pixels and operates at 3 frames/second.

These detectors feature a 100% X-ray absorption, have a fill factor of 86%, a sensitivity of 120pC/mR.cm^2, a DQE of 60% at 5 lp/mm, a dynamic range of 12 bits and a lag of less than 1% after 30 ms. These performances are compared to those of other approaches. It is concluded that Selenium detectors are well suited for mammography applications.