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X-ray Fluorescence and X-ray Transmission Microtomography Imaging System

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An X-ray Transmission Microtomography (CT) system combined with an Xray Fluorescence Microtomography (XRFCT) system was implemented in the Brazilian Synchrotron Light Source (LNLS), Campinas, Brazil. The main of this work is to determine the elemental and absorption distribution map in breast tissue samples. The experiments were performed at the X-Ray Fluorescence beamline (D09B-XRF) of the Brazilian Synchrotron Light Source (LNLS), Campinas, Brazil. A quasi-monochromatic beam produced by a multilayer monochromator was used as an incident beam. The fluorescence photons were collected with an energy dispersive HPGe detector (CANBERRA Industries inc.) placed at 90 o to the incident beam, while transmitted photons were detected with a fast Na(Tl) scintillation counter (CYBERSTAR-Oxford anfysik) placed behind the sample on the beam direction. All the tomographic images were reconstructed using a filtered-back projection algorithm.

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