

X-ray fluorescence tomography developments for studies of challenging samples.

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The X-ray Fluorescence (XRF) is one of the most important tools for elemental quantification and mapping in biological and medical samples. Our recent efforts has been focused on expansion of regular two-dimensional X-ray Fluorescence imaging in order to obtain three-dimensional distribution of various elements within relatively large sample without sectioning, which may result in sample damages and artifacts. We have improved XRF set up and tested different data acquisition schemes for optimal tomographic reconstructions using TomoPy.

Here we present our progress in 3D visualization of rather large and dense sample of soil with distribution Selenium-labeled bacteria through it. Optimizations developed for this study are crucial for biological, environmental sciences and material science applications.