1015-68-281 **Thomas Asaki** (`asaki@lanl.gov`), Los Alamos National Laboratory, Los Alamos, NM 87545, **Ousseini Lankoande** (`ousseini@lanl.gov`), Los Alamos National Laboratory, MS J594, Los Alamos, NM 87545, and **Robert M Owczarek*** (`rmo@lanl.gov`), Los Alamos National Laboratory, MS J594, Los Alamos, NM 87545. *Mathematical Methods of Analysis of Gamma/hard X-ray radiography.* Preliminary report.

Scientific radiography uses high energy (hard) X-rays that have both photon energy and beam intensity significantly higher than commonly used and analyzed in medical radiography. This energy range imposes specific challenges on image analysis techniques, not present in the medical X-ray range. One example constitutes Compton scattering. It leads to significant blur in the images. On the other hand high energies of X-ray beams allow for getting images for very dense materials. This information can and is used to reconstruct composition of multi-layer bodies, where the layers are built of a variety of materials. The research on such reconstructions is important for nonproliferation efforts. Mathematical methods developed specifically for the scientific hard X-ray/gamma radiography are discussed. (Received February 07, 2006)