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Hanna E Makaruk* (hanna_m@lanl.gov), P-21 Applied Modern Physics Group, MS-D410, LANL, Los Alamos, NM 87545. *3D object reconstruction from a single radiogram – outside of the Inverse Abel method.* Preliminary report.

Reconstruction of a 3D object from its 2D radiogram requires an additional assumption to make it unique. In particular, Inverse Abel transform uses the assumption of axial symmetry for the reconstruction. However, the assumption does not necessarily need to be one of axial symmetry. A good quality radiogram (adequate beam power, detector) is a sum of contributions of all the objects seen by the beam – and different constraints can be applied for each “component” of this sum. In case of an object containing parts that are axially symmetric and parts that are either i) not axially symmetric or ii) symmetric in relation to two or more different axes, correct reconstruction for a single radiogram requires more steps than in a simple axially symmetric case. More importantly, the reconstruction can be still exact and unique. For many problems there is a rich set of information about the object included in the radiogram, not utilized in the Inverse Abel transform, which can serve as the additional assumption in the cases considered here. Animations obtained from the strict analytical solutions for the discussed objects are presented. (Received February 19, 2013)