1080-68-40 **Hanna Makaruk*** (hann_m@lanl.gov), MS D410, P-21, Los Alamos National Laboratory, Los Alamos, NM 87545. *Generalization of Inverse Abel Transform 3D objects reconstruction from single radiographs for selected cases not fulfilling the axial symmetry assumption.* Preliminary report.

Inverse Abel Transform is a standard way of reconstructing a 3D axially symmetric object from a single radiographic image. Experimental radiographic data rarely fulfill strict mathematical requirement about the symmetry. Therefore we need to quantify the error generated when the symmetry assumption is not strictly satisfied. In fact we may try to achieve even more: to generalize the Abel Inversion procedure in order to recreate the objects also in cases with known or expected perturbation of the symmetry. The errors in classical Inverse Abel Transform applied to reconstruction of objects with the axial symmetry perturbed include volumes of reconstructed negative density of macroscopic size, with the negative values comparable to or even bigger than the original object's density. Explanation of these surprising reconstructions was the starting point of our investigation. Analytical results and their comparison with some experimental examples and/or synthetic radiograms will be presented. (Received December 12, 2011)