



## Quantitative Object Reconstruction Using Abel Transform Tomography and Mixed Variable Optimization

By Kevin Robert O'Reilly

Biblioscholar Nov 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x6 mm. This item is printed on demand - Print on Demand Neuware - Researchers at the Los Alamos National Laboratory (LANL) are interested in quantitatively reconstructing an object using Abel transform x-ray tomography. Specifically, they obtain a radiograph by x-raying an object and attempt to quantitatively determine the number and types of materials and the thicknesses of each material layer. Their current methodologies either fail to provide a quantitative description of the object or are generally too slow to be useful in practice. As an alternative, the problem is modeled here as a mixed variable programming (MVP) problem, in which some variables are nonnumeric and for which no derivative information is available. The generalized pattern search (GPS) algorithm for linearly constrained MVP problems is applied to the x-ray tomography problem, by means of the NOMADm MATLABr software package. Numerical results are provided for several test configurations of cylindrically symmetrical objects and show that, while there are difficulties to be overcome by researchers at LANL, this method is promising for solving x-ray tomography object reconstruction problems in practice. 100 pp. Englisch.



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