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Rim Gouia* (rim.gouia@mavs.uta.edu). *Inversion of the circular Radon transform from partial data.*

The circular Radon transform Rf puts into correspondence to a given function f its integrals along circular trajectories. The need for such a transform arises in several contemporary problems of medical imaging, synthetic aperture radar and non destructive testing.

The major problems related to the circular Radon transform are the existence and uniqueness of its inversion, inversion formulas and the range description of the transform. In the case, when the circular Radon transform Rf is known for circles of all possible radii, there are well developed theories now addressing most of the questions mentioned above. However, many of these questions are still open when Rf is available only a part of all possible radii.

The aim of my presentation is to discuss some new results about existence and uniqueness of the inversion of the circular Radon transform from partial data and briefly describe the mathematical challenges of this inversion. (Received July 11, 2010)