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**Bernard A Mair\*** ([bam@math.ufl.edu](mailto:bam@math.ufl.edu)), Department of Mathematics, University of Florida, P.O. Box 118105, Gainesville, FL 32611-8105, **Murali Rao** ([rao@math.ufl.edu](mailto:rao@math.ufl.edu)), Department of Mathematics, University of Florida, P.O. Box 118105, Gainesville, FL 32611, and **John M Anderson** ([anderson@ece.ufl.edu](mailto:anderson@ece.ufl.edu)), ECE Department, University of Florida, P.O. Box 116130, Gainesville, FL 32611. *Applications of Measure Theory to Imaging.*

Many problems in imaging are equivalent to solving Fredholm integral equations of the first kind in which the images are usually modeled by functions. By using examples in emission tomography and stereology, we demonstrate that the modeling of certain physical processes give rise to images which are more suitably described by measures rather than functions. We discuss theoretical convergence of the Expectation Maximization (EM) algorithm for obtaining maximum likelihood (ML) estimators and address the "numerical divergence" seen in applications. (Received September 29, 2000)