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Ranadhir Roy* (rroy@utpa.edu), Mathematics Department, University of Texas-Pan American, 1201 W University Drive, Edinburg, TX 78539. *Molecular imaging: inverse problems.*

Optical tomography (inverse) problems arise in medical (molecular) imaging for cancer screening. Molecular imaging is formulated as an optimization problem and I solved by a gradient based optimization method is. We applied the penalty/modified barrier function (PMBF) method instead of Tikhonov regularization technique to make the inverse problem well-posed. Different numerical methods are used to solve the inverse problem. We found that the reconstructed image improves as more a prior information is included in our model. (Received December 08, 2014)