1062-49-257 **Zhaoxia Yang*** (ychaox@mail.sysu.edu.cn), **Andrzej Krol** (krola@upstate.edu), **Yuesheng Xu** (yxu06@syr.edu) and **David H. Feiglin** (feiglind@upstate.edu). *Application of bias-noise curve for selecting hyperparameter for the total variation norm in the maximum a posteriori expectation maximization reconstruction in SPECT myocardial perfusion imaging.*

The purpose of this study was to develop a more accurate method for estimation of the optimal value of hyperparameter for the Total Variation (TV) norm in the iterative Bayesian Maximum A Posteriori Ordered Subsets Expectation Maximization (MAP-OSEM) one step late tomographic reconstruction with Gibbs prior. Our aim was to reach the lowest bias at the lowest noise while maximizing uniformity and spatial resolution of the reconstructed myocardium in the parallel-beam collimator Single Photon Emission Computed Tomography (SPECT) myocardial perfusion imaging. Conventional approach is to use the highest curvature point on the L-curve to estimate the optimal value. However, we found the bias-noise curve obtained for the Region Of Interest (ROI) located inside the myocardium provides better estimation of the optimal value than the L-curve. Consequently, significantly higher quality of the reconstructed myocardium was attained , as compared to L-curve. We conjure that the bias-noise curve for a ROI located in the structure of interest (in our case the myocardium) provides local information on this structure, as opposed to the global information provided by the L-curve thus allowing better tuning of hyperparameter for the optimized reconstruction of this structure. (Received August 10, 2010)