

Meeting: 1003, Atlanta, Georgia, SS 5A, AMS Special Session on Radon Transform and Inverse Problems, I

1003-92-1611 **Larry A Gratton*** (Larry_Gratton@berea.edu), CPO 1934, Berea College, Berea, KY. *High resolution reconstruction from nonuniform data sets in fan beam computed tomography.* Preliminary report.

An algorithm is presented which utilizes the reflection property of the divergent beam transform to produce high resolution tomographic reconstructions from fan beam data. The combined direct and reflected sampling points form a nonuniform, and generally nonperiodic, sampling set. We introduce a novel decomposition of the data function in Fourier space and an interpolation algorithm based on recent advances in nonuniform sampling theory. The interpolated data set has twice the density in the detector direction as the standard sampling set and permits a doubling of the reconstruction resolution with only just more than twice the number of source positions. This algorithm represents an improvement over previous methods which require further oversampling in the number of source positions or dynamic detector shifts. Numerical results from both synthetic and real data are presented. (Received October 05, 2004)