1035-62-1410 **Arkady Shemyakin** and **Jason Q McClintic*** (jqmcclintic@stthomas.edu). *Parametric Estimation for Single Photon Emission Computed Tomography (SPECT).* Preliminary report.

In a nutshell, single photon emission tomography (SPECT) is a method of creating 2-D and 3-D images of radioactive objects. Tomography is imaging by slices or sections, and in SPECT 3-D images are compilations of many 2-D images. Work presented is a continuation of a long-standing effort to improve the resolution of said 3-D images by improving the way in which the underlying 2-D images are processed. SPECT techniques are commonly used in nuclear medicine.

The model is of three parallel planes. One contains a randomly located radiation source, the second is a filter, and the takes images of the observed radiation distribution. The resulting image is a cloud of points with a bivariate Cauchy distribution. Radiation is assumed to be distributed uniformly in direction of the upper half sphere and the quantity is a Poisson flow.

Following existing theoretical work, numerical models and software are created to simulate the above model and implement the theoretical analysis to process the images and estimate both the location and error regions for those estimates of the center of the observed point cloud in the image. Some theoretical results about the software are also obtained. (Received September 19, 2007)