

## PC-Based Auto QA Program for CT Scanners Used in Radiation Therapy Treatment Planning

Radiation Therapy Treatment planning requires knowledge of many aspects of the CT images used for the treatment plan. Such aspects include knowledge of x-ray linear attenuation scale (electron density) and other aspects such as pixel size for accurate patient dimensions. In a more general sense, it is also useful to know other physical performance aspects such as slice width, incrementation accuracy, spatial resolution, noise and uniformity levels, and effective energy of the CT beam.

This program will demonstrate how a commercially available CT phantom and QA software have been modified to encompass the increased demands of radiation therapy CT QA. In particular, the number and range of samples used for the CT linear attenuation scale has been evaluated to select an optimal set of targets for CT linear attenuation evaluation. The selected range of electron densities span a range from air through compact bone.

An additional aspect of the paper is to present the effects of phantom size ranging from 16cm up to large body annuli of 40 or more cm diameter. Significant differences in resulting CT calibration scale will be demonstrated by scans of samples in specially designed phantom housings offering a range of size and positional variation of the CT samples.

Examples will be shown of the routine use of such programs for daily CT QA and specific Radiation Therapy treatment applications.