1068-00-340 **Xiangyang Tang*** (xiangyang.tang@emory.edu), WCI suite C-5018, 1701 Uppergate Drive, Atlanta, GA 30322, and **Yi Yang** and **Shaojie Tang**. *Noise characteristics of x-ray tube and grating based phase CT over spatial resolution.*

As an emerging imaging modality for preclinical/translational applications, the x-ray tube and grating-based phase CT has seen increasing research activity recently. By providing a visualization of object's refraction distribution, the x-ray tube and grating-based phase CT is expected to provide a higher subject contrast in comparison to the conventional attenuation CT, since the refractive coefficient used for imaging with the former is substantially larger than that for imaging with the latter. The projection of the derivative refraction coefficient is detected in data acquisition. Thus, the well-known ramp filter in the filtered backprojection image reconstruction can be replaced by the finite Hilbert filter that is much more tractable in noise. With an analytic analysis and simulation-based experimental evaluation, we quantitatively describe the noise property of x-ray tube and grating based phase CT and its comparison with that of the conventional attenuation CT over exposures and detector cell size. In addition, given detector size, we will compare their spatial resolution. In such a way, the potential contrast-to-noise ratio of the phase CT and its advantages over the conventional attenuation CT for the preclinical/translational applications can be fully characterized. (Received January 20, 2011)