

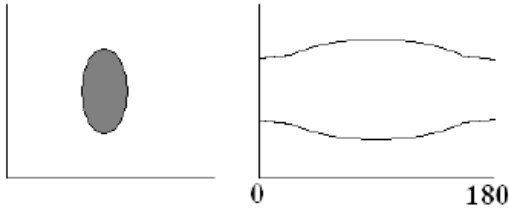
Homework 5

Due Friday, March 7- Noon, 2008

Drop Box #8 Everitt Basement

1. How is the contrast mechanism for Nuclear Medicine different than for X-ray imaging? Contrast the information derived from Nuclear Imaging compared to X-ray imaging. (10 points)

- 2) The following elliptical object is imaged with a corresponding sinogram.



- a) Does 0° correspond to imaging from top to bottom or right to left? Justify.
- b) Assuming the object was rotated by 45° and by 90° , draw the subsequent sinograms.
- c) If the original object were shifted in the space by a few millimeters to the left but with the same region covered by the imaging system, draw the subsequent sinogram.
- d) If the original object were shifted in space by a few millimeters up but with the same region covered by the imaging system, draw the subsequent sinogram.
- e) If the object was shifted by a few millimeters to the left as imaging system reached a scan angle of 45° , draw the subsequent sinogram. (30 points)

3. Problem 2.1 in the book (20 points).

4. Problem 2.5. in book (20 points).

5. 3) Assume there exists initially 10^8 atoms of $^{99}_{42}\text{Mo}$ in a technetium generator Determine the number of stable $^{99}_{43}\text{Tc}$ produced in 24 hours. (20 points).

Bonus question (20 points)

6. Problem 2.3 in the book. How do the radioactivity of the parent and daughter products compare if $\lambda_1 \gg \lambda_2$