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Application of Dual Energy X-ray Radiography/Tomography on Nuclear and Related Materials

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This study investigates the principle and capabilities of Dual Energy X-Ray Radiography/Tomography when applied on nuclear and related materials. The dual-energy X-ray technique is a significant improvement to X-ray imaging systems and gives additional information on the composition of the object being imaged. Within this technique, two radiographs are obtained at two distinct X-ray energies and are combined (divided, subtracted) to give detailed information about the material features with improvement of the image contrast. X-rays for this research, will be generated with a new 225 kV microfocus X-ray system to be commissioned by June 2011 at the Nuclear Energy Cooperation of South Africa (Necsa). This system will be able to generate different peak energy X-rays at different anode target materials at very small focal spot sizes in order to obtain high-resolution images. Different X-ray filters will be utilized to shape the energy of the X-ray beam for high energy X-rays to interact with the material. This presentation focuses on the principles of X-ray generation with different anode materials and the utilization thereof in radiographs and tomograms.

**Level (Hons, MSc,
 PhD, other)?**

Msc

**Consider for a student
 award (Yes / No)?**

yes

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

no

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