Contribution ID: **313** Type: **Oral Presentation**

NON-SPECIALIST LECTURE: Penetrating Radiation: The Power of Tomography as an Analytic Research Tool

Tuesday, 30 June 2015 14:00 (40 minutes)

Abstract content
   (Max 300 words)
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Since Cormack and Houndsfield invented the first Computer Assisted Tomography (CAT) scanner to be used in a medical environment in 1972, the utilization of application of the "tomography" concept were exploited by many researchers and in many other areas of application over the past 44 years. For South African researchers, the advantage of using a CAT scanner became a reality when these machines were implemented in hospitals around the country. The first clinical CT scanners were installed after 1976. The original systems were dedicated to head imaging only, but "whole body" systems with larger regions of interests became available in 1976. However, the purpose of these machines was very specific to the medical industry and results could not be optimized for "industrial" samples e.g. rocks, wood, metals, ect.

South Africa hosts a number of research based state-of-the-art tomography facilities which use X-rays, neutrons or Gamma–rays as penetrating radiation and as investigating probe to be applied in any environment or experimental set-up. These available facilities are likely to be utilized by researchers but due to a lack of knowledge and exposure to the technology, the facilities remain under utilized.

This talk will focus on the evolution of the principle of computer tomography, the problems facing researchers in the early days during the development phases of tomography technology until today where the hardware and software in use provide remarkable speed, minimum time and dose and excellent spatial resolution for optimal application in many fields of application e.g. geosciences, biosciences, engineering, metallurgy, etc.

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Primary author: Mr DE BEER, Frikkie (Necsa)

Co-authors: Mr HOFFMAN, Jakobus (Necsa); Mr BAM, Lunga (Necsa); Mr RADEBE, Mabuti Jacob (Necsa); Mr NSHIMIRIMANA, Robert (NECSA)

Presenter: Mr DE BEER, Frikkie (Necsa)

Session Classification: Applied

Track Classification: Track F - Applied Physics