

The International Nuclear Atlantic Conference (INAC 2005) will take place in Mendes Convention Center, Santos - São Paulo, Brazil, August 28 - September 02, 2005.

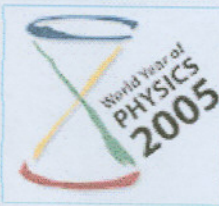
Following the success of INAC 2002 which was inaugurated in Rio de Janeiro, INAC 2005 will be held with the 14th Meeting on Reactor Physics and Thermal Hydraulics (XIV ENFIR) and the 7th Meeting on Nuclear Applications (VII ENAN), as joint nuclear conferences. A key goal of these joint meetings is to bring together scientists to exchange the latest research and development (R&D) information in nuclear science and technology.

In the INAC 2005 technical program, plenary sessions, such as round table discussions and keynote lectures, will be held to present to the general public the recent advances of peaceful nuclear energy usage, reducing the global warming. Besides, INAC 2005 will offer a poster technical session on Management Systems for Nuclear Organizations.

The XIV ENFIR will cover all aspects of interdisciplinary R&D related to nuclear reactors, and the VII ENAN will offer a forum for discussion on nuclear applications in industry, geology, agriculture, medicine, biology and environmental sciences. Both will organize oral and poster technical sessions.

We intend to organize a special issue of the journal Progress in Nuclear Energy (ISSN 0149-1970) comprising selected papers derived from the XIV ENFIR and VII ENAN.

We look forward to seeing you in Santos for the INAC 2005. Take home fresh ideas and renewed enthusiasm.



August 28 to September 02
2005

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Acknowledgments

Abstracts of Invited
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Mendes Convention Center

Av. Francisco Glicério, 200 - Santos/SP - Brazil

NUCLEAR ENERGY REDUCING GLOBAL WARMING



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MONTE CARLO SIMULATION OF X-RAY SPECTRA IN DIAGNOSTIC RADIOLOGY AND MAMMOGRAPHY USING GEANT4

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ABSTRACT

The open-source object-oriented toolkit GEANT4 was used to simulate x-ray spectra in diagnostic radiology and mammography. The simulations were performed using different combinations of target, filters and tube voltages. All the relevant physical processes were included in the calculations: Compton scattering, photoelectric effect, Rayleigh scattering, bremsstrahlung and ionization. The analyzed energy range is from 10 keV to 150 keV. Both Penelope and Low Energy physical models included in the Low Energy extensions of GEANT4 toolkit were used in this work. Range cuts for electron and gamma were set to 500 nm and 3000 nm, respectively. The simulated x-ray spectra using both physics models were compared with calculated spectra generated by the IPEM report number 78. Results show good agreement for the bremsstrahlung intensity for the spectra with tube voltages 40 kV, 100 kV and 150 kV, while the bremsstrahlung intensity is larger for the simulated spectra with 25 kV and 30 kV. Simulated characteristic peaks present lower intensities all spectra. These discrepancies should be related with the ionization process and/or the atomic relaxation implemented in the code. The cross section tables for electrons used in the simulations should be checked.