Contribution ID: **25** Type: **not specified**

Positron emission tomography simulation using GATE

Thursday 4 July 2024 14:45 (45 minutes)

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Abstract
Monte Carlo simulation is a powerful tool for modeling physical processes with random characteristics, particularly in the fields of nuclear and particle physics. In this hands-on exercise, participants will explore GATE simulations applied to nuclear medical imaging, with a focus on positron emission tomography (PET) systems. Participants will build a simple PET imaging model using two detectors, understand the parameters in the simulation configuration, and analyze the results. Through this exercise, participants will gain insights into the principles of coincident event recording from positron-electron pair annihilation processes, the fundamentals of slice imaging, the factors affecting the signal-to-noise ratio (SNR), and methods for noise reduction to improve PET image quality.

Presenter: HOANG, Trang (University of Science, Ho Chi Minh City, Vietnam)