

## عنوان مقاله:

Performance comparison of four commercial GE discovery PET/CT scanners: A monte carlo study using GATE

## محل انتشار:

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## خلاصه مقاله:

Combined PET/CT scanners now play a major role in medicine for in vivo imaging in oncology, cardiology, neurology, and psychiatry. As the performance of a scanner depends not only on the scintillating material but also on the scanner design, with regards to the advent of newer scanners, there is a need to optimize acquisition protocols as well as to compare scanner performances on an objective basis. In this study we evaluate and compare the performance of 4 Commercial GE PET/CT cameras, the (i) BGO-based Discovery LS PET/CT (DLS), (ii) the BGO-based Discovery ST PET/CT (DST), (iii) the BGO-based Discovery STE PET/CT (DSTE) and finally (iv) the LYSO-based Discovery RX PET/CT (DRX) scanner using the Geant4 Application for Tomographic Emission (GATE). GATE is an open source Monte Carlo simulation platform developed for PET and SPECT studies and is supported by the OpenGATE collaboration. In accordance with the National Electrical Manufacturers Association (NEMA) NU 2-2001 protocols, the validation of models is carried out against actual published measurements and the performance comparison is done for sensitivity, scatter fraction and count rate performance, showing very similar performance compared with published results, thus enabling investigations to better model system performance (e.g. resolution degradation) within the reconstruction task.. The simulated results demonstrate highest sensitivity performance with the DST (though with the highest scatter fraction), and highest NECR performance for the LYSO-based DRX, The results also show that DRX, DLS and DSTE PET/CT cameras have nearly the same amount of scatter fraction

## کلمات کلیدی:

Positron emission tomography (PET), Scanner performance, Gate

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