

Welcome to the Twiki web page of the G4MSBG initiative: G4-Med

Purpose

The aim of the Geant4 Medical Physics Benchmarking Group (G4MSBG) is to develop a fully automatised Geant4 benchmarking and regression testing system for medical physics applications, called G4-Med. A set of Geant4 Physics Constructors and Lists of interest for medical physics applications are tested. The tests are integrated in the geant-val test system to be executed for benchmarking and regression testing. The test are executed using the CERN computing infrastructure.

List of current tests

Currently the G4-Med system includes 18 tests.

Test	geant-val layout	Authors
Photon attenuation coefficients	PhotonAttenuation	S. Guatelli, L. Pandola
Electron stopping powers	ElectronDEDX	V. Ivanchenko
Low energy electron backscattering	ElectronBackScat	P. Dondero, A. Mantero, V. Ivanchenko, M. Novak
Electron scattering from foils at 13-20 MeV kinetic energies	ElecForwScat	B. Faddegon, J. Ramos-Méndez
Bremsstrahlung yield	Bremsstrahlung	B. Faddegon, J. Ramos-Méndez
Fano cavity	Fano cavity	P. Arce, M. Maire, M. Novak
Electron Dose Point Kernel	LowEElecDPK	S. Incerti, M.-C. Bordage, I. Kyriakou, Y. Perrot
Microdosimetry	Microyz	S. Incerti, I. Kyriakou
Brachytherapy - dose rate	Brachy-ir	S. Guatelli, D. Cutajar
Dosimetry - clinical 5-6 MeV electron beam	To be added	L. Desorgher
Dosimetry for mammography	Mammo	C. Fedon, I. Sechopoulos
Hadronic nucleus-nucleus inelastic cross section	NucNucInelXS	D. Sakata, S. Guatelli, E. Simpson
Bragg curves in water for 67.5 MeV protons	LowEProtonBraggPeak	B. Faddegon, J. Ramos-Méndez
Absolute neutron yield for protons	ProtonC12NeutronYield	B. Faddegon, J. Ramos-Méndez
Production cross sections of different fragments	C12FragCC	C. Omachi, T. Toshito, T. Sasaki
62 MeV /n C-12 fragmentation on Carbon target	LowEC12Frag	C. Mancini-Terracciano
400 MeV/n C-12 fragmentation	C12Frag	D. Bolst, S. Guatelli, F. Romano
Estimation of proton radiobiological damage	Radiobiology	G. Petringa, GAP Cirrone L. Pandola, G. Cuttone
Light ion (proton, 3He, carbon) range and depth dose curves in water	LightIonBraggPeak	M. Cortes-Giraldo, A. Perales, J. M. Quesada Molina

Development of the benchmarking/regression system and Integration of tests in geant-val [↗](#)

- D. Konstantinov and G. Latyshev, NRC Kurchatov Institute, IHEP

Collaborators

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Presentations

- M. A. Cortes-Giraldo et al., "G4_Med, a Geant4 benchmarking tool for medical physics applications"; ENSAR2 workshop: Geant4 in nuclear physics; Madrid (Spain), April 24-26, 2019.
- S. Guatelli et al., "G4_Med, a Geant4 benchmarking tool for medical physics applications"; MCMA 2019, Montreal, Canada, June 19-21, 2019.

-- SusannaGuatelli - 2019-04-18

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