Introduction to medical physics applications

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http://www.ge.infn.it/geant4/events/

Geant4 Workshop, CERN, 30 September 2002
LowE e.m. users+developers open session

Wednesday 2 September, 14 - 18.30

- Geant4 medical applications at LIP, P. Rodrigues, LIP
- GATE, D. Strul, Lausanne
- Dosimetry for brachytherapy techniques, S. Guatelli, Genova/CERN
- Dosimetry in a parallel computing environment, S. Chauvie, Torino
- IORT and metabolic therapy, D. Cucé, Cosenza
- Application to hadrontherapy for ocular melanoma, P. Cirrone, Catania

Tea

- Simulation for a dark matter experiment, A. Howard, IC London
- Applications in Gran Sasso experiments, S. Parlati, Gran Sasso Lab
- Simulation for the LISA gravitational wave experiment, H. Araujo, IC London
- Test beam simulation for the ESA mission to Mercury, A. Mantero, Genova
- Projects by user groups in Spain (nuclear physics), B. Quintana Arnes

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Dosimetry
Comparison with conventional treatment planning systems (and experimental data)
Advanced techniques: IORT, IMRT
Metabolic therapy
Radiodiagnostics

\[ \chi^2 / ndf (GEANT4) = 0.52 \]
\[ \chi^2 / ndf (TMS) = 0.81 \]
\[ \chi^2 / ndf (PLATO) = 6.71 \]
Brachytherapy 1 year later

Which one is right?
How does Geant4 perform?
How well do Standard and LowE e.m. do?

dose distribution from a radioactive source

exp. data Savona

TG43 protocol
Technology transfer

Particle physics software aids space and medicine

M.G. Pia and J. Knobloch

Geant4 is a showcase example of technology transfer from particle physics to other fields such as space and medical science [...].

CERN Courier, June 2002

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Dark matter searches, $\nu$ physics, astrophysics, gravitational waves...

Spectrum from a Mars-simulant rock sample
Tomorrow (LowE e.m.) = Δ review

LowE e.m. validation

Many results from medical + astroparticle domain

Plots by 19 people, from 9 countries
(LowE developers + users)