Geant4 Simulation of Low-Energy X-rays Xoft Machine

NICOLAS RECALDE, University of South Carolina — In the past decade, miniature X-ray sources developed by Xoft Inc. (an iCad company, Sunnyvale, CA) have become the modality of choice for the treatment of specific cancer lesions. The X-ray spectra of these sources have a typical endpoint of 50 keV. We aim to quantify the energy deposition in matter when using this machine, and one of the first steps is to characterize the X-ray distribution from this source. For that purpose we have done Geant4 simulations of the Xoft X-ray spectrum and compared against precise experimental data obtained at NIST. We found that radiation transport at low energy can be very sensitive to small variations in manufacturing specifications.