



PHYSICS AND ASTRONOMY COLLOQUIUM

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“From Slow X-ray Imaging to Fast Electron Beam Radiotherapy”

Abstract

Two topics will be presented in this talk. First, novel x-ray fluorescence computed tomography (XFCT) imaging technique will be introduced. The potential of high-sensitivity molecular imaging with XFCT will be demonstrated by a series of Monte Carlo simulations and experiments. In addition, a design of a preclinical imaging system will be discussed. To conclude the topic, advantages and shortcomings of XFCT will be discussed.

In the second part of the talk, the feasibility of rapid radiotherapy with very high-energy electron (VHEE) beams will be presented. VHEE dose calculated by Monte Carlo will be compared to dose measured in an electron beam line at SLAC National Accelerator Laboratory. Optimized VHEE dose distributions calculated with Monte Carlo will be compared to dose distributions for state-of-the-art treatment techniques for a number of patients. Lastly, the difference in cell-kill between 30-minute-long and second-long irradiations in four cell lines will be presented.

Tuesday, February 04, 2014

2:30 p.m.

Engineering & Computer Science Building

Room 116