

Abstract Submitted
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Cerenkov Radiation as a New In Vivo Imaging Modality NICOLE ACKERMAN, Stanford Physics Department, REHAN ALI, Stanford School of Medicine, Radiation Oncology, J. MATT NOLL, Stanford Applied Physics Department, EDWARD GRAVES, Stanford School of Medicine, Radiation Oncology and Molecular Imaging Program — Čerenkov radiation has been used in particle detectors for years, but has recently been “rediscovered” by biologists working with radioactive isotopes. Čerenkov Light Imaging (CLI) can be done with CCD devices typically used for fluorescence or bioluminescence imaging. This provides the first opportunity for *in vivo* imaging of beta emitting isotopes, such as those used for radiation therapy. The GEANT4 simulation package has been used to simulate the properties and limitations of CLI. The simulation begins with the radioactive decay, generates the Čerenkov photons, propagates the optical light through tissue and other materials, and allows for different detection geometries. The simulation results are compared to *in vivo* and *in vitro* data taken in the Stanford Small Animal Imaging Core Facility.

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