Abstract Submitted for the DNP11 Meeting of The American Physical Society

Photonuclear Production of Medical Isotopes¹ NICK WEINANDT, University of South Dakota — Every year, more than 20 million people in the United States receive a nuclear medicine procedure. Many of the isotopes needed for these procedures are under-produced. Suppliers of the isotopes are usually located outside the United States, which presents a problem when the desired isotopes have short half-lives. Linear accelerators were investigated as a possible method of meeting isotope demand. Linear accelerators are cheaper, safer, and have lower decommissioning costs compared to nuclear reactors. By using (γ ,p) reactions, the desired isotope can be separated from the target material due to the different chemical nature of each isotope. Isotopes investigated were Cu-67, In-111, and Lu-111. Using the results the photon flux Monte Carlo simulations, the expected activity of isotopes can be calculated. After samples were irradiated, a high purity germanium detector and signal processing apparatus were used to count the samples. The activity at the time of irradiation stop was then calculated. The uses of medical isotopes will also be presented.

¹Thanks to Idaho State University, the Idaho Accelerator Center, and the National Science Foundation for supporting the research.

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Date submitted: 27 Jul 2011

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