AbstractID: 6979 Title: Comparison of Dose Distributions from Monte Carlo Simulations to Radiochromic Film Measurements on Stents Coated with P-32 or Pd-103

Monte Carlo simulations of a cylindrical shell coated on the outside with either P-32 or Pd-103, representing a radioactive BX stent, were performed using the MCNP4C code for comparison with radiochromic film measurements. In the simulations, the surroundings of the stent matched the experiments closely in composition, mass density, and geometry. The stent, modeled as a cylindrical shell, was mounted on a cylindrical polymethylmethacrylate rod, in a cylindrical hole in a block of Solid Water water-equivalent-plastic. The axis of the hole was parallel to the top surface of the block and below it by approximately the radius of the stent. Radiochromic film, which was modeled as pure mylar, was stacked to a thickness of 3 mm on the top surface of the block. As in the measurements there were two types of film. The type directly on the block had a density of 1.43 g/cc, matching the measured density of Gafchromic HD810 film. On top of that was film with a density of 1.24 g/cc, matching the measured density of MD-55-2 film. More Solid Water was placed on top of the film. The Monte Carlo tally bins were narrow strips the length of the stent, parallel to the stent axis. Each one corresponded to an average of the measured dose over a strip of film. For each of the two radioisotopes, a percent depth dose curve calculated from the Monte Carlo tallies agreed well with a percent depth dose curve from the corresponding average measured doses.