

3-D Dose Distribution Calculations Surrounding a Pd-103 Stent

Clinical trials are currently assessing the efficacy of intravascular brachytherapy in reducing the occurrence of restenosis. Yet, it is still a matter of debate as to which technique, catheter or radioactive stent, will prove to be clinically superior. We are currently investigating the dosimetry of a metallic stent implanted with the radioisotope Palladium-103. As part of this ongoing project, a calculated 3-D dose distribution surrounding the stent will be compared to measured data. We used the EGS4 / DOSRZ Monte Carlo user-code to acquire the 3-D dose distribution surrounding a single strut of the stent. With the use of rotation and translation matrices, we were able to position the strut, with its respective dose distribution, into each of the 181 individual strut positions that make up a stent. Employing the superposition principle, we then acquired the 3-D dose distribution surrounding the entire stent.