

**Purpose:** To develop a dose calculation package based on Monte Carlo simulation for SAVI breast cancer brachytherapy treatment using patient's CT data.

**Methods:** A realistic model of the patient was created using anonymized patient data including images, structures and plans from the treatment planning system. Images were then voxelized and each voxel assigned a density and material value base on its calibrated Hounsfield units. Materials included were fat, muscle, lung, air, bone, and Nitinol. This data was then imported into the penEasy Monte Carlo code. Each source position from the plan was then run individually and the dose was totaled after weighting each source by its dwell time from the original plan. Energies used were those of the VariSource IR-192.

**Results:** The resulting dose was compared to the dose from the original plan and plotted side by side. Dose differences were considered that occurred outside the air cavity, particularly in the evaluated planning target volume (PTV<sub>eval</sub>), which is calculated as 1 cm outside the cavity subtracting the cavity itself, the skin and the chest wall. Dose from the Monte simulation looked similar in shape and intensity to the original plan.

**Conclusions:** We have developed a Monte Carlo simulation package to calculate dose distributions for SAVI based breast cancer brachytherapy using patient's CT and plan parameters extracted directly from a commercial planning system.