

AbstractID: 11630 Title: A Simple Method for Dose Fusion from Multi-modality  
Treatment: Brachytherapy to External Beam Therapy

**Purpose:** In case of suboptimal dose to 90% volume ( $D_{90}$ ) obtained from post-implant dosimetry study after prostate brachytherapy, it is difficult to determine what needs to be done next. If additional external beam radiation were needed, then there is no standard operating procedure for boost treatment. In order to avoid treating prostate regions that received adequate or very high dose from radioactive seeds, we need to transfer the dose matrix information from seed implant software to external beam treatment software as accurate as possible. Therefore, we have explored the feasibility of such task that is accomplished by using commonly used Variseed® and Eclipse® programs with proper interface. **Method and Materials:** Four weeks after prostate seed implant, CT scans were performed on the whole pelvis of patients using our standard protocol for prostate planning. The acquired CT datasets were reconstructed using different sizes of field of view (FOV). The images with limited FOV focusing on prostate were imported into Variseed® for post-operation implant evaluation, while images with full FOV were imported in Eclipse® treatment planning system (TPS) for future boost planning.

**Results:** Dose matrix resulted from the post-op evaluation was exported from Variseed® in standard DICOM format and imported into Eclipse TPS. The brachytherapy dose matrix was registered with the patient images with full FOV in Eclipse TPS. Targets for dose boost were defined based on the isodose curves from brachytherapy. An external photon beam plan was then generated to deliver dose to compensate for selected underdosed cold regions. **Conclusion:** Accurate external beam radiation treatment planning utilizing cold-spot treating IMRT technique can be accomplished using our planning protocols. The proposed technique can be utilized to safely deliver additional external radiation dose using IMRT technique after suboptimal brachytherapy procedure.