AbstractID: 11641 Title: Extension of an Informatics Architecture to Compare and Analyze 3D Dosimetric Data

Purpose: Novel 3D dosimetry techniques illustrate the urgent clinical need for tools for the comparison and visualization of dose data from various dosimeters. We present results from a collaborative effort to develop clinically useful methods to view, compare, and analyze dose data from a variety of dosimeters. **Method and Materials:** The development of a high-resolution 3D dosimetry system (PRESAGE^{TM} and optical-CT) has motivated the re-tooling of a previously existing informatics system – the Computational Environment for Radiotherapy Research (CERR) - to enable it to compare 3D dose data. Three different types of clinical dose distributions measured/calculated in PRESAGE dosimeters, EBT Gaf-Chromic films and the Eclipse Treatment Planning System were used in this investigation. An intuitive and clinically relevant process for the comparison of these dose distributions has been developed. All volumetric (PRESAGE and Eclipse) and planar (EBT film) dose data was linked to the DICOM data and metadata of the irradiation. This allowed all doses to be registered to the relevant CT scan and viewed in 3D in standard, easily navigable, anatomic orientations. **Results:** Gamma analyses, line profiles, and dose-difference plots were generated using the CERR platform. Relevant discrepancies amongst measured and calculated doses from different dosimeters were assessed and addressed from a single open-source software platform. **Conclusions:** A comprehensive and flexible tool for 3D dosimetry, plan specific QA, and research is needed. CERR, with appropriate extensions, was found to be valuable as a tool for the comparison of doses measured using various techniques. Newer developments being implemented involve the integration of more advanced film calibration functionality, the ability to calculate 3D gamma volumes, and the ability to produce a *dosimetry* report including relevant information for patient specific plan evaluation.