

AbstractID: 13918 Title: Optical fiber based ionizing radiation microdetector

**Purpose:** Develop an optical fiber based isotropic detector for ionizing radiation dose in water-equivalent materials that could be used for a variety of measurements in situations where isotropy and spatial resolution are of major concern (e.g. for IMRT, IGRT, and brachytherapy QA in complex non-idealized geometry settings, where currently available diode-type detectors display relatively large un-isotropy).

**Method and Materials:** Commercially available plastic scintillators, optical fibers, a QE65000 Ocean Optics spectrometer, and a laptop computer were used to measure the response of “in house” built millimetric detectors for several setups and known calibrated ionizing radiation beams (from a Varian 21EX linear accelerator).

**Results:** A proportional response was observed for the known dose at different depths in a water-equivalent phantom for 6 MV and 18 MV photon beams and electron beams between 6 MeV and 20 MeV in a relatively wide window of the measured spectra, after background and stray light corrections were applied.

**Conclusion:** A relatively simple, robust, and inexpensive isotropic detector based device can be developed by replacing the spectrometer with a set of inexpensive light detectors with an efficient response at the desired wavelength window.

Conflict of Interest (only if applicable): N/A