

**Purpose:** To evaluate the angular dependence and linearity of OSL dosimeters in diagnostic x-ray energy ranges.

**Method:** A diagnostic x-ray unit was used to evaluate InLight/OSL nanoDot dosimeters. Eight angles were chosen ( $0^\circ$ ,  $45^\circ$ ,  $90^\circ$ ,  $135^\circ$ ,  $180^\circ$ ,  $225^\circ$ ,  $270^\circ$ , &  $315^\circ$ ) reflecting the position of an OSL dosimeter with respect to the x-ray table. The angular dependence was investigated at 4 techniques: 81 kVp at 50 mAs and 200 mAs, and 117 kVp at 50 and 200 mAs. Each dosimeter was irradiated at 100 cm SID, centered on a 15x15 cm collimation field and positioned in one of the 8 angles. For the linearity, two kVps were tested with a range of mAs from 32 to 400. The stability of the tube output was monitored with a calibrated detector.

**Results:** Considering the  $0^\circ$  dosimeter reading as the reference, preliminary results showed a significant reduction in dose at 81 kVp, more pronounced with 50 mAs. A decrease of about 50% was shown in the  $90^\circ$  and slightly less with  $270^\circ$ . Considerable reduction was also observed at  $45^\circ$ ,  $135^\circ$ , &  $225^\circ$ . Results for 117 kVp will also be presented. Tube output was highly reproducible throughout the experiment (coefficient of variation:  $< 0.1\%$ ). Linearity results at both kVps showed good linearity ( $R > 0.99$ ).

**Conclusion:** OSL nanoDot dosimeters exhibited excellent linearity but showed a considerable angular dependence in the diagnostic kVp energy ranges used. This could be of concern when such point dosimeters are used to evaluate skin dose in CT.