

**Purpose:** An analytic procedure was developed and validated to determine why the TLD measured lateral skin dose of angular tube-current-modulated CT-urography exams was 7% less than the anterior skin dose even though the tube current in the lateral projection was greater by about a factor of 2 than anterior tube current and the lateral skin was 6 cm closer to the x-ray focal spot (the closest distance to tube focal spot path). **Method:** Exponential attenuation, exponential absorption, and inverse square law were used to estimate the anterior and lateral dose to a mis-centered cylindrical test object. The source filter was described by the diameter of a cylindrical object, i.e., the filter would attenuate such that detected intensity is constant when such an object of that size is centered in the data collection field of view. Surface exposure measurements used 16-cm, 20-cm, and 32-cm acyclic test objects. **Results:** For constant tube current the surface exposure was a decreasing function distance between the center of tube rotation and object surface. Surface doses had a weak dependence on phantom size when the skin surface was greater than 5 cm from center of tube rotation. A 100 cm filter fit surface phantom surface exposures. The analysis predicted that the lateral skin dose would be a factor of 2 lower than the anterior dose. **Conclusion:** The patient skin dose can be determined by the product CTDI measured in air at CT scanner center of tube rotation and a factor that is determined by the distance the skin surface is from the center of tube rotation. The comparisons with direct skin dose measurements were a useful QA procedure. **Conflict of Interest:** Christianne Leidicker is an employee of Siemens.