

## AbstractID: 1852 Title: Accurate And Precise Commissioning Of Small Photon Beams Or Beamlets Formed By MLC Using Film Dosimeters

A method for measuring the Scattering Factor (SF), Tissue Maximum Ratio (TMR), and Off-Axis Ratio (OAR) for narrow photon beams shaped by various multileaf collimators was developed and tested with Kodak EDR2 films. The films were placed perpendicular to the narrow beams at the specific depths. In each field measurement, we irradiate the films with four little-over quadrant fields that have common intersection on the small field. Then, another set of the films were irradiated with two strip fields and an open field. Based on superposition principle, subtraction of the two films would yield exactly the same irradiation as that of the narrow beam. Which allows us to accurately measure or calculate the flat dose at the central areas of the quadrants on both films and then correct the dose deviation measured on the individual films. After making the dose correction, subtraction of the maximum doses on the two films would provide the accurate SF and TMR for the small fields. The OAR was easily scanned on the films with direct small field irradiation. With this technique, no water scanning system is required, making it practical to generate complete beam data from the film dosimeter. Our experimental results demonstrated that the new method significantly improved the film dosimeter accuracy for narrow beams and provide comparable TMR and SF as well as OAR data by using the stereotactic diode for small square field sizes in the range of 3 x 3 to 6 x 6 mm<sup>2</sup>.