

## AbstractID: 3385 Title: Small electron field cutout output factors measured using a 2D ion chamber array compared to radiographic film

**Purpose:** To compare the electron cutout output factor (COF) of small fields measured by two methods: radiographic film (Kodak X-Omat V) and the Seven29 (PTW) 2D small volume ion chamber array.

**Method and Materials:** The COFs for four small electron fields were measured on a Varian-2100C accelerator with a 10 cm x 10 cm cone at 6 MeV. Radiographic film and Seven29 array ion chamber were set perpendicular to the central axis of the beam. The film and effective point of measurement for the 2D array were both set at  $d_{max}$ . Solid water was used for build up in both cases, and 100 cm SSD was set at the top surface of the solid water. The data were measured using 10 to 400 monitor units (MU) for Seven29 and 30 to 200 MU for the film. The open 10 cm x 10 cm insert data from film measurement was used to compute the film parameters of maximum optical density (OD) and sensitivity based on a single hit model. These parameters were used later to convert the measured cutout data from OD to dose for the COF calculation. The OD was read from a Digital Densitometer II.

**Results:** The Seven29 ion chamber array behaved linearly as a function of MU as expected, which provided an identical COF regardless of the number of MU's used (less than 1% difference). The COF results from the Seven29 and from film measurements showed a maximum difference of 1.6%.

**Conclusions:** The 2D ion chamber array can be used to measure the COF for a small electron fields. Using the Seven29 to measure small field COF will save measurement time compared to using film dosimetry, and in addition, this is also beneficial to filmless departments.