

AbstractID: 4723 Title: Monte Carlo dosimetric study of the Flexisource Ir-192 HDR source

**Purpose:** Brachytherapy with high dose rate (HDR) sources of  $^{192}\text{Ir}$  is a usual practice in clinical brachytherapy today. The TG43 U1 update report recommends that accurate dose distribution data of the brachytherapy source in use should be obtained experimentally or by Monte Carlo (MC), to be used as input in the HDR Treatment Planning System (TPS). The purpose of this study is to obtain the dose rate distribution in liquid water media for the Flexisource HDR  $^{192}\text{Ir}$  source (Isodose Control GmbH, Germany) using the Monte Carlo method to obtain the TG43 U1 parameters and the 2-D rectangular dose rate table.

**Material and methods:** The MC code GEANT4 (7.1 version) was used to estimate dose rate in water and air-kerma strength around the Flexisource Ir-192 source following the TG43 U1 recommendations. All the details about the design and material of the Flexisource have been included in the simulation.

**Results:** A complete dosimetric dataset for the Flexisource is presented. TG43 dosimetric functions and parameters have been obtained as well as a 2-D rectangular dose rate table, consistent with the TG43 dose calculation formalism.

**Conclusions:** The dosimetric parameters and functions obtained for the Flexisource have been compared with that obtained in the literature for other HDR sources, showing that the use of specific datasets for this new source is justified. This dataset can be used as input in the TPS and to validate its calculations. As policy of BRAPHYQS-ESTRO task group, this dataset will be incorporated to the website: <http://www.uv.es/braphyqs> available to users in excel format.