



The Abdus Salam
**International Centre
for Theoretical Physics**
50th Anniversary 1964–2014



JOINT ICTP-IAEA WORKSHOP ON DETERMINATION OF UNCERTAINTIES OF MEASUREMENTS IN MEDICAL RADIATION DOSIMETRY

9 - 13 June 2014

Miramare, Trieste, Italy

The aim of this Workshop is to familiarize physicists, working in radiation dosimetry laboratories or lecturers teaching radiation dosimetry, with procedures and methodologies that should be utilized for the determination of uncertainties in medical radiation dosimetry.

Contrary to earlier practice, when the terms error and uncertainty were used interchangeably, the modern approach distinguishes between these two concepts. Traditionally, an error has been viewed as having two components, namely a random component and a systematic component. According to present definitions, an error is the difference between a measured value and the true value. If errors were known exactly, the true value could be determined; in reality, errors are estimated in the best possible way and corrections are made for them. Therefore, after application of all known corrections, errors do not need any further consideration and the quantities of interest are uncertainties. An error has both a numerical value and a sign. In contrast, the uncertainty associated with a measurement is a parameter that characterizes the dispersion of the values “that could reasonably be attributed to the measurand”. This parameter is normally an estimated standard deviation. An uncertainty, therefore, has no known sign and is usually assumed to be symmetrical. It is “a measure” of our lack of exact knowledge, after all recognized systematic effects have been taken into account by applying appropriate corrections.

Uncertainties of measurements are expressed as relative standard uncertainties and the evaluation of standard uncertainties is classified into type A and type B. The method of evaluation of type A standard uncertainties is by statistical analysis of a series of observations, whereas the method of evaluation of type B standard uncertainties is based on means other than statistical analysis of a series of observations.

The IAEA, understanding the need to provide practical guidance on the estimation of measurement uncertainty in dosimetry, has incorporated a specific section on this topic in relevant publications on radiation dosimetry, such as the IAEA TRS-398 (Absorbed Dose Determination in External-Beam Radiotherapy An-International Code of Practice for Dosimetry Based on Standards of Absorbed Dose to Water), IAEA TRS-454 (Quality Assurance for Radioactivity Measurement in Nuclear Medicine), IAEA TRS-457 (Dosimetry in Diagnostic Radiology: An International Code of Practice) and IAEA TEC DOC-1585 Measurement Uncertainty: A Practical Guide for Secondary-Standards Dosimetry Laboratories).

PARTICIPATION

The Workshop would seek to target radiation physicists working in calibration laboratories or dosimetry laboratories, or lecturers teaching and conducting practical sessions in radiation dosimetry.

Scientists and students from all countries which are members of the United Nations, UNESCO or IAEA may attend the Workshop. As it will be conducted in English, participants should have an adequate working knowledge of this language. Although the main purpose of the Centre is to help research workers from developing countries, through a programme of training activities within a framework of international cooperation, students and post-doctoral scientists from developed countries are also welcome to attend.

As a rule, travel and subsistence expenses of the participants should be borne by the home institution. Every effort should be made by candidates to secure support for their fare (or at least half-fare). However, limited funds are available for some participants from developing countries, to be selected by the organizers. There is no registration fee.

How to Apply

The Online Application Form can be accessed at the ICTP activity website:

http://cdsagenda5.ictp.it/full_display.php?ida=a13234

Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form.

Activity Secretariat

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TOPICS

Introduction to uncertainties in measurements

General aspects of uncertainties in radiation dosimetry

Uncertainties in the realization of primary standards in dosimetry

Uncertainties in the realization of secondary standards in dosimetry

Uncertainties in radiotherapy dosimetry

Uncertainties in X-ray diagnostic radiology dosimetry

Uncertainties in radiation protection dosimetry

Practical sessions on the determination of uncertainties in radiation dosimetry

APPLICATION DEADLINE

31 March 2014