IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Technical Meeting on New Trends and Advances in Microdosimetry and its Applications

Virtual Event

27–30 October 2020

Ref. No.: EVT1904203

Information Sheet

Introduction

Microdosimetry is the subfield of radiation physics that regards the systematic study of the spatial and temporal distribution of the absorbed energy in microscopic structures within the irradiated matter, which are stochastic by nature. Although it originated more than sixty years ago, microdosimetry is still attracting high scientific interest nowadays in radiation medicine, radiation protection, radiation biology and other fields such as space research.

In the field of radiation medicine, microdosimetry is particularly relevant for ion beam therapy, which is one of the most promising techniques to cure a number of tumors minimizing the damage on healthy tissue. In this medical application of ionizing radiation as well as in radiation protection, the conventional measurement of the absorbed dose is not sufficient to explain the biological effects of the radiation in the human body such as the variation of radiobiological effectiveness along the path of a clinical ion beam.

In radiation protection and in a number of modalities in radiation medicine, therefore, weighting factors are applied to the conventional dosimetric quantity absorbed dose in order to account for the biological effectiveness of the particular radiation quality. Examples include proton and ion beams, neutrons as well as kilovolt X-rays as used in brachytherapy. Micro and nanodosimetry (also known as structural microdosimetry, the extension of microdosimetry to smaller dimensions), have been developed to provide radiation quantities that capture the influence of the stochastic nature of radiation interactions and, hence, the properties of different radiation qualities responsible for their different relative biological effectiveness.

Objectives

The aim of the Technical Meeting is to gather up-to-date information and status of the field of microdosimetry, and in particular experimental microdosimetry, in order to enhance and boost the research and applications of microdosimetry in IAEA Member States. The main topics/focus will concern the current state of the art of development of microdosimeters and instrumentation, computational tools, methodology used in microdosimetry, non-clinical use of detectors as well as future perspectives and demands.

The topics to be covered during the meeting:

Introductory concepts

- Radiation quality in Radiation Protection and in Radiation Therapy
- Microdosimetric and nanodosimetric
- approach Instrumentational and computational tools

Developments and instrumentation

Computational tools

Non-clinical use of detectors

Outlook, Perspectives, and Demands

Target Audience

The event is intended for individuals from Member States that are involved in the field of microdosimetry through development, simulation or use.

Working Language(s)

English

Participation and Registration

All persons wishing to participate in the event have to be designated by an IAEA Member State or should be members of organizations that have been invited to attend.

In order to be designated by an IAEA Member State, participants are requested to send the **Participation Form (Form A)** to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) for onward transmission to the IAEA by **11 September 2020**. Participants who are members of an organization invited to attend are requested to send the Participation Form (Form A) through their organization to the IAEA by above deadline.

Selected participants will be informed in due course on the procedures to be followed with regard to administrative and technical matters.

Papers and Presentations

The IAEA encourages participants to give presentations on the work of their respective institutions that falls under the topics listed above.

Participants who wish to give presentations are requested to submit an abstract of their work. The abstract will be reviewed as part of the selection process for presentations. The abstract should be in A4 page format, should extend to no more than one pages (including figures and tables). It should be sent electronically to Mr Natko Skukan, the Scientific Secretary of the event (see contact details below), not later than **11 September 2020**. Authors will be notified of the acceptance of their proposed presentations by **30 September 2020**.

In addition, participants have to submit the abstract together with the **Participation Form (Form A)** and the attached **Form for Submission of a Paper (Form B)** to their competent national authority (e.g. Ministry of Foreign Affairs, Permanent Mission to the IAEA or National Atomic Energy Authority) or their organization for onward transmission to the IAEA not later than **11 September 2020.**

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Subsequent correspondence on scientific matters should be sent to the Scientific Secretary/Secretaries and correspondence on other matters related to the event to the Administrative Secretary.

Event Web Page

Please visit the following IAEA web page regularly for new information regarding this event:

www.iaea.org/events/EVT1904203