

Instructions for authors

The text should be prepared using WORD (or a compatible word processing program) and **an electronic copy should be provided**. Tables and graphs should be incorporated where appropriate. NEA publications are not printed in colour. Please keep this in mind when preparing figures, which should be suitable for reproduction in greyscale.

Please use the following specifications for your document:

Paper size	Margins		Body text font	Headings font
A4 (21 × 29.7 cm)	Top: 3.6 cm	Header: 2.5 cm	Caecilia Roman, point size 9* <i>or</i>	Arial bold (point size 12 for titles, point size 10 for sub-headings)
	Bottom: 3.5 cm	Footer: 2.5 cm	Times New Roman, point size 11	
	Left: 2.5 cm			
	Right: 2.5 cm			

* Caecilia Roman is preferred; if unavailable, however, contributions formatted in Times New Roman are acceptable.

The paper title should be in font Arial, point size 12, bold, centred and written in sentence case. Specify 60 points before, 36 points after.

List the name of the author and his affiliation (no space before or after). Type the “Abstract” heading (Arial, size 10, bold, lowercase, centred). Specify 36 points before, 6 points after; provide a brief summary and state the purpose of the text. Italicise the abstract text, and indent by .75 cm, left and right.

The main text should be typed in one column, single-spaced, justified left and right. The first line of each paragraph should be indented by 0.75 cm. Specify 6 points after each paragraph.

Headings, sub-headings, sub-sub-headings should be typed in font Arial, sentence case, and written in **bold, bold and italics** and *italics* respectively. Please avoid numbering sections if possible and specify 12 points before and 6 points after each heading, sub-heading, sub-sub-heading.

Table and figure titles should be typed in font Arial bold, size 9.5, in sentence case, centred above the item in question, with 6 points before and 8 points after.

When using bullets and numbering, please use a 0.75-cm indent.

References are cited in the text using the author’s surname and year of publication between brackets: (Sartori, 2000). A reference list should be provided at the end of the text, with sources listed in alphabetical order.

Papers should be limited to 10 pages, including all tables and graphics.

If you have any questions concerning these instructions, please feel free to contact:

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Some preliminary results about narrow beam dosimetry

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Abstract

Organ doses and effective doses have been estimated by Monte Carlo simulations with the FLUKA code in the case of an anthropomorphic phantom exposed to narrow beams of various kinds of radiation. The energy range from 1 MeV to 1 GeV has been investigated. Though the work is still in progress, some preliminary results are presented.

SAMPLE ABSTRACT PAGE

Introduction

Data for protection against ionising radiation from external sources are usually expressed in terms of conversion coefficients from measured quantities to radiation protection quantities calculated in various irradiation geometries. All the geometries are related to a broad unidirectional beam, or plane parallel beam, virtually of infinite extent, irradiating an anthropomorphic phantom. When an assessment of partial exposures of human body is required, the broad-beam data are inadequate. In particular, when applied to narrow beams, they lead to errors in the estimates of the body quantities, the degree depending on the irradiation geometry and on the kind and energy of particles. The exposures to gas bremsstrahlung and synchrotron radiation beams are typical circumstances in which data adequate for narrow beam dosimetry are required.

At the SATIF-2 meeting a group of experts, including the author of this paper, was charged with the problem of narrow beam dosimetry. Some preliminary calculations have been performed and the results are presented here.

Calculations have been carried out by Monte Carlo simulations with the most recent version of the FLUKA code (Sartori, 2003) for narrow beams of various kinds of monoenergetic particles normally incident on some selected organs of an hermaphrodite phantom. The mathematical model of the phantom has already been described in previous papers (NEA, 2003; Kodeli, 2008). Photons, electrons, protons and neutrons have been considered as primary particles. The energy range investigated was 1 MeV to 1 GeV.

Calculations

Calculations have been performed prevalently with monoenergetic photons as primary particles. A 0.2×0.2 cm² square beam has been considered impinging somewhere on a fixed organ (target organ) of the phantom. The organs selected as targets were: brain, breast, lung, oesophagus

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The energy per primary particle deposited in the 88 regions of the hermaphrodite phantom, representing the various organs and tissues of the human body, has been determined to be a result of the simulations. The organ doses have been estimated as arithmetic mean of the doses received by the single constituent regions. The effective dose has been evaluated according to the definition given in ICRP Publication 60 (ICRP, 1990), as modified in ICRP Publication 69 (ICRP, 1995).

The statistical uncertainties were estimated by making calculations in several batches and computing the standard deviation of the mean. The total number of histories was large enough to keep the standard deviation on the effective doses below few per cent.

The calculated results are presented in Tables 1-4 for photon energy of 1 MeV, 10 MeV, 100 MeV and 1 GeV, respectively. In each table the following data are given: target organ; dose to the target organ followed by the standard deviation (in brackets); other organs significant irradiated, i.e. other organs whose equivalent doses, when multiplied for the pertinent weighting tissue factors, have resulted at least as large as 1% of the weighted target dose ($w_{\text{TARG}} \times H_{\text{TARG}}$); effective dose, followed by the standard deviation (in brackets); per cent contribution of organs different from the target one in the calculation of the effective dose (E).

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