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KARYA ILMIAH : JURNAL ILMIAH

Judul Karya Ilmiah (Artikel) : Correlation Between Anterior-Posterior and Lateral Dimensions and the Effective and Water-Equivalent Diameters in Axial Images from Head Computed Tomography Examinations

Jumlah Penulis : 5 Orang

Status Pengusul : ~~Penulis pertama/ Penulis ke-3/ Penulis Korespondensi~~ **

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Semarang, 26 Mei 2022

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Reviewer 2



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Prof. Dr. Kusworo Adi, S.Si., M.T.
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Reviewer 1

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NIP. 195806151985031002

Unit Kerja : Fisika

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Paper ini membahas tentang perhitungan dosis pasien pada citra organ kepala dengan pemeriksaan CT secara retrospektif. Parameter yang digunakan adalah diameter efektif (D_{eff}) dan diameter setara air (D_w) dengan dimensi anterior-posterior (AP), lateral (LAT) dan AP+ LAT. Nilai rata-rata D_w lebih tinggi dari nilai rata-rata dari D_{eff} , karena D_w mempertimbangkan ukuran geometris, komposisi tubuh dan redaman.
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Semarang, 6 Juni 2022
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Prof. Dr. Kusworo Adi, S.Si., M.T.
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CORRELATION BETWEEN ANTERIOR-POSTERIOR AND LATERAL DIMENSIONS WITH THE EFFECTIVE AND WATER-EQUIVALENT DIAMETERS IN AXIAL IMAGES FROM HEAD COMPUTED TOMOGRAPHY EXAMINATIONS

[Dewi, Winda Kusuma^a](#); [Anam, Choirul^a](#); [Hidayanto, Eko^a](#); [Wati, Annisa Lidia^a](#); [Dougherty, Geoff^b](#)

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^a Department of Physics, Faculty of Sciences and Mathematics, Diponegoro University, Semarang, Central Java, Indonesia^b Department of Applied Physics and Medical Imaging, California State University Channel Islands, Camarillo, CA 93012, USA[Full text options](#) [Abstract](#)[Indexed keywords](#)[SciVal Topics](#)[Chemicals and CAS Registry Numbers](#)**Abstract**

The study aims to correlate the effective diameter (Deff) and water-equivalent diameter (Dw) parameters with anterior-posterior (AP), lateral (LAT) and AP+LAT dimensions in order to estimate the patient dose in head CT examinations. Seventy-four patient datasets from head CT examinations were retrospectively collected. The patient's sizes were calculated from the middle slice using a software of IndoseCT. Dw and Deff were plotted as functions of AP, LAT and AP+LAT dimensions. The best trendline fit for LAT and AP functions was a second order polynomial, which resulted in R² of 0.89 for Deff vs LAT, 0.88 for Dw vs LAT, 0.92 for Deff vs AP and 0.91 for Dw vs AP. A linear correlation was found for Deff vs AP+LAT, Dw vs AP+LAT and Dw vs Deff with R² of 0.97, 0.96 and 0.98, respectively. © The Author(s) 2021. Published by Oxford University Press. All rights reserved. For Permissions, please email: journals.permissions@oup.com.

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UNCERTAINTY ASSOCIATED WITH THE USE OF SOFTWARE SOLUTIONS UTILIZING DICOM RDSR FOR SKIN DOSE ASSESSMENT IN INTERVENTIONAL RADIOLOGY AND CARDIOLOGY

Marko Krajinović ✉, Miloš Vujisić, Olivera Ciraj-Bjelac

Radiation Protection Dosimetry, Volume 196, Issue 3-4, November
2021, Pages 129–135, <https://doi.org/10.1093/rpd/ncab146>

Published: 27 September 2021 **Article history** ▼

Abstract

Purpose

The purpose of this work is to provide a comprehensive analysis of uncertainties associated with the use of software solutions utilizing DICOM RDSRs for skin dose assessment in the interventional fluoroscopic environment.

Methods and Results

Three different scenarios have been defined for determining the overall uncertainty, each with a specific assumption on the maximum deviations of factors affecting the calculated dose. Relative expanded uncertainty has been calculated using two approaches: the law of propagation of uncertainty and the propagation of distributions based on the Monte Carlo method. According to the propagation of uncertainty, it is estimated that the lowest possible relative expanded uncertainty of ~13% (at the 95% level of confidence, i.e. with the coverage factor of $k = 2$ assuming normal distribution) could only be achieved if all sources of uncertainties are carefully controlled, whereas maximum relative expanded uncertainty could reach up to 61% if none of the influencing parameters are controlled properly. When the influencing parameters are

JOURNAL ARTICLE

DEVELOPMENT OF EMERGENCY MONITORING SYSTEM FOR ALPHA-PARTICLE-EMITTING RADIONUCLIDES IN THE AIR

Tomonori Hokama ✉, Hiroki Fujita, Masanao Nakano, Takeshi Iimoto

Radiation Protection Dosimetry, Volume 196, Issue 3-4, November 2021, Pages 136–140, <https://doi.org/10.1093/rpd/ncab139>

Published: 28 September 2021 **Article history** ▼

Abstract

During the early phase of a nuclear accident, major radioactive materials are released into the environment, necessitating the prompt deployment of various protective actions to avoid or reduce radiation exposure. To implement these actions, the levels of radioactivity in the environment should be determined. However, the radioactivity concentrations of artificial alpha-particle-emitting radionuclides such as plutonium are difficult to measure in airborne samples, because they are interfered with natural radionuclides such as uranium decay products. Therefore, chemical separation is required to measure the concentrations. This study presents a new emergency monitoring system for airborne samples, which performs multiple-pulse time-interval analysis (MTA) without chemical separation. The system is used in conjunction with an alpha/beta-particle survey meter and adopted an analysis method focusing on the detected time interval of each particle. Its features are that a short time to output measurement result, easy handling and nondestructive. The estimated detection limit of the system was $9.5 \times 10^{-2} \text{ Bq m}^{-3}$. The MTA-based monitoring system could be useful in situations requiring prompt measurement and screening of samples.