LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Karya Ilmiah (Artikel)	:	Calculation application of patient's dose on fluoroscopy x-ray machine		
Jumlah Penulis	:	3 orang		
Status Pengusul	:	~~Penulis pertama~~/ Penulis ke-2/ ~~Penulis Korespondesi~~ **		
Identitas Jurnal Ilmiah	:	a. Nama prosiding	:	Journal of Physics: Conference Series
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		c. Tahun terbit, tempat pelaksana	:	2019, Jawa Tengah, Indonesia
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		e. Alamat web jurnal	:	https://iopscience.iop.org/article/10.1088/1742-6596/1217/1/012024
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Semarang, 27 Mei 2021

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Prof. Dr. Kusworo Adi, S.Si., M.T.
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LEMBAR
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Hasil Penilaian *Peer Review* :

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In the 8th International Seminar on New Paradigm and Innovation on Natural Science and Its Application (8th ISNPINSA)

Held on 26 September 2018 at Gets Hotel, Semarang, Indonesia
with paper entitled as follows:

The Application Design Records Patient Doses on a Fluoroscopy X-Ray Machine

DEAN OF FSM UNDIP

Prof. Dr. Widowati, S.Si, M.Si
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Calculation application of patient's dose on fluoroscopy X-ray machine

Arifin Z.[a, b] ; Hidayanto E.[a, b] ; Suhardi[a, b]

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[a] Department of Physics, Faculty of Science and Mathematics, Diponegoro University, Jl. Prof. H. Soedarto, Tembalang, Semarang, Indonesia

[b] Telogorejo Hospital, Jl. Kh Ahmad Dahlan, Pekunden, Semarang, Indonesia

Abstract

Dose recording in patients is not well implemented and so far has not been supported by the dose panel on the X-ray machine. Therefore, it is necessary to develop a dose-record application capable of storing dose data to support the patient's radiation safety. It also refers to the regulation of diagnostic radiology service standards, medical records, and hospital accreditation standards regulated by the Ministry of Health. This study aimed to design an application of patient dosage record for abdominal examination with a Fluoroscopy X-ray machine. The design of dosage record application is done by exposing to radiation output and voltage (kV) variation of X-ray irradiation on 63-94.8 kV, current strength on

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PREFACE

The 8th International Seminar on New Paradigm and Innovation on Natural Sciences and Its Application (ISNPINSA-8) is annual seminars organized by Faculty of Sciences and Mathematics (FSM) Diponegoro University and has been successfully conducted since 2011. The ISNPINSA-8 was held in Semarang, Indonesia on September 26th 2018. The aims of ISNPINSA are to facilitate brain storming and state of the art information in field of sciences and mathematics; to increase innovation of technology that can be applied in industries; to contribute in formulating strategy to increase the role of science for community; and to stimulate collaboration between industries, researchers and government to increase community welfare. The theme of 8th ISNPINSA in 2018 is "*Science and Applied Science for Sustainable Development Goals*".

The number of participants of the seminar were 272 including keynote speakers, invited speakers, oral presenters, poster presenters, and non presenters coming from various institutions of various countries, including Japan, Philippines, Thailand, Malaysia, Australia, Bangladesh, China, Kazakhtan, Vietnam and those who come from all parts of Indonesia consist of researchers, lecturers, postgraduate and undergraduate students from various universities. There are 272 papers were presented in this seminar, consist of 5 keynote speakers, 237 oral presentations, and 30 poster presentations. After the selection process, there are 184 articles selected papers to be published in the present conference proceeding. This is the largest number of papers and participants for eight times the implementation of ISNPINSA. The scope of the field of participants comes from various fields including biology, physics, chemistry, statistics, mathematics, informatics, environment, public health, and relevant fields that contribute to sustainable development.

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Preface

Papers

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Synthesis and characterization of silicone rubber composite silica as the x-ray shielding

S Y Astuti, H Sutanto, G W Jaya, E Hidayanto and Z Arifin

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Application of MCNP for determining the distribution of absorbed dose in lung brachytherapy by using radiation γ ^{131}cs

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An investigation of a CT noise reduction using a modified of wiener filtering-edge detection

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Abstract. The aims of this study were to investigate the noise reduction in a CT image using a modified Wiener filtering-edge detection method. We modified the noise reduction algorithm of a combination of the Wiener filter and edge detection by addition of a dilation stage after edge detection. We then evaluated kernel size of the Wiener filter, threshold values in the edge detection, and size of structuring elements in the dilation process. Images of adult anthropomorphic and self-built wire phantoms were acquired by the new 4-row multislice CT Toshiba Alexion™. The images of the anthropomorphic phantom were used for a visual evaluation, while the images of the wire-phantom were used to obtain the spatial resolution and noise of the images. A Wiener filter-edge detection filter coupled with dilation, potentially reduced more CT noise. We found that the spatial resolution and noise of the filtered images were influenced by the size of the Wiener filter kernel, threshold of edge detection, and size of structuring element.

1. Introduction

Several approaches have been proposed to reduce CT dose without compromising image quality. One method has been proposed is the tube current modulation (TCM) [1, 2]. In TCM, tube currents decrease and increase proportionally with the decreasing and increasing attenuation of body parts [3]. Tube current modulation could be implemented by the rotation of the x-ray tube (angle-modulation) or by modulation in the direction of the longitudinal axis (Z-modulation), or a combination of both [4]. Another method proposed for reducing the dose is to utilize iterative reconstruction (IR) [5], instead of filtered back-projection (FBP). In fact, the IR technique is not only iterative during reconstruction but also iteratively processes in either the sinogram [6] or image spaces [7], in accordance with the specific physical modeling or statistical approaches. There are several IR software products used by major CT vendors including ASIR, AIDR, VEO, IRIS, SAFIRE, and iDose [8]. However, the details of the algorithms are very sparse, and they are still considered proprietary algorithms [5].

Another method that can be used for CT dose reduction is the use of noise reduction in the image space [8]. A noisy image due to acquisition with a small tube current-time (mAs) parameter can have

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Growth and fabrication of 850 nm AlGaAs/GaAs vertical cavity surface emitting laser structure

N I Cabello*, P M Tingzon, H A Husay, J D Vasquez, R Jagus, K L Patrocenio, K C Gonzales, G A Catindig, E A Prieto, A Somintac, A Salvador and E Estacio

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Abstract. In this work, we demonstrate the NIP's all in-house development of a vertical cavity surface emitting laser structure. The VCSEL structure grown via MBE consists of an AlAs/AlGaAs distributed Bragg reflector and an AlGaAs/GaAs quantum well designed to issue at the 850 nm region. Reflectance spectroscopy showed that the stop band is centered around the designed wavelength. The electroluminescence spectra displayed that the maximum light emission corresponded to its design. This is a crucial step in the NIP's development of semiconductor lasers, leading towards future high-speed and highly-tunable VCSEL devices.

1. Introduction

Semiconductor lasers have been at the forefront of high-speed interconnects, thanks to the development of lasers capable of operating at gigahertz speeds [1]. Expansion to other applications such as proximity sensing [2] and light detection and ranging (LIDAR) [3] have driven further research on this field. For high-speed devices, switching speeds at the gigahertz range are desired [1], while high tuning speeds and increased tunability are sought for wavelength-tunable devices [4]. With its molecular beam epitaxy (MBE) and device fabrication facilities, the National Institute of Physics (NIP) has recently renewed its research thrust in this field, most notably on vertical cavity surface emitting lasers (VCSELs).

The VCSEL is a type of semiconductor laser with light emission orthogonal to the wafer plane. Its main advantages over other conventional semiconductor lasers such as edge-emitting lasers are the ease of coupling to optical fibers, direct wafer scale probing and low threshold operation [5]. A standard VCSEL design is composed of an optical cavity with an active region in the center, which is usually a quantum well (QW). The optical cavity is then sandwiched between two distributed Bragg reflectors (DBRs), which are highly reflecting mirrors composed of alternating high and low refractive index medium materials. The stop band of the DBR, which is the wavelength region with the highest reflectance, should coincide with the QW emission wavelength. Oxidation apertures, usually situated near the active region, are also employed for optical and current confinement [6].

In this paper, we report on the all in-house development of an AlGaAs/GaAs-based DBR VCSEL structure at the chip level. The whole process entails the whole production processes: the growth of the layers, device fabrication, and characterization of both as-grown and device-fabricated layers. Oxidation was also performed to explore the possibility of current and optical confinement effects [6].

2. Experimental Details