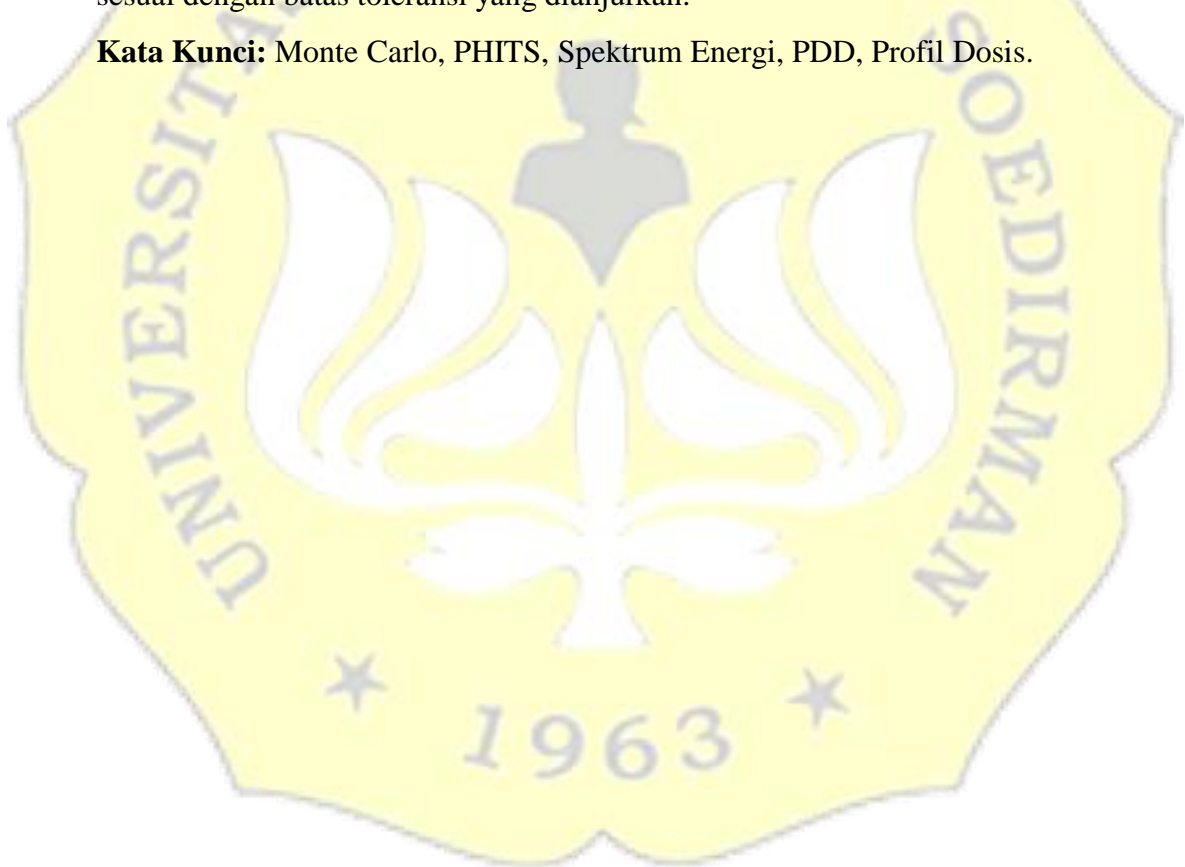


## ABSTRAK

Telah dilakukan simulasi menggunakan metode monte carlo pada pesawat Linac 10 MeV. Tujuan penelitian memodelkan geometri pesawat linac menggunakan *flattening filter* berlapis dan menentukan kurva *Percentage Depth Dose* dan Profil Dosis. Pemodelan dilakukan menggunakan pendekatan simulasi program PHITS. Pemodelan dilakukan dengan SSD 100 cm dan luas medan radiasi  $10 \times 10 \text{ cm}^2$  yang mengenai *phantom* air. Hasil penelitian menunjukkan bahwa program PHITS mampu memodelkan pesawat Sinar-X dalam bentuk visualisasi 2D dan 3D. Serta menggambarkan distribusi fluks foton Sinar-X mulai dari sumber sampai *phantom* air. Spektrum Sinar-X yang dihasilkan pada pemodelan berupa spektrum karakteristik dan *bmsstrahlung*. Hasil simulasi menggunakan *flattening filter* berlapis menghasilkan kurva *Percentage Depth Dose* (PDD) dan kurva Profil Dosis dengan nilai *build up* 2,5 cm dan kerataan sebesar 0,27 %. Hasil tersebut sesuai dengan batas toleransi yang dianjurkan.

**Kata Kunci:** Monte Carlo, PHITS, Spektrum Energi, PDD, Profil Dosis.



## **ABSTRACT**

*Simulations have been carried out using the monte carlo method on a 10 MeV Linac aircraft. The aim of this research is to model the geometry of a linac airplane using flattening filter layered and defined curves Percentage Depth Dose and Dosage Profile. Modeling is done using the PHITS program simulation approach. Modeling was carried out with a 100 cm SSD and a radiation field area of 10x10 cm<sup>2</sup> which is about Phantom water. The research results show that the PHITS program is capable of modeling X-ray machines in the form of 2D and 3D visualizations. As well as describing the distribution of X-ray photon flux from the source to Phantom water. The X-ray spectrum generated in the modeling is in the form of a characteristic spectrum and braking radiation. Simulation results using flattening filter layered to produce a curve Percentage Depth Dose (PDD) and Dosage Profile curve with values build up 2.5 cm and a flatness of 0.27%. These results are in accordance with the recommended tolerance limit.*

**Keywords:** Monte Carlo, PHITS, Energy Spectrum, PDD, Profile Dose.

