ANALISIS PENGARUH LEBAR MAGNET *NEODYMIUM* PADA KINERJA *PERMANENT MAGNET SYNCHRONOUS GENERATOR* (PMSG) 12 *SLOT* 8 *POLE* MENGGUNAKAN *SOFTWARE MAGNET INFOLYTICA*

TESIS

Karya Ilmiah sebagai salah satu syarat untuk menyelesaikan jenjang strata dua (S-2) di Departemen Teknik Elektro, Fakultas Teknik, Universitas Andalas

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Judul	Analisis Pengaruh lebar Magnet Neodymium pada Kinerja Permanent Magnet Synchronous Generator (PMSG) 12 Slot 8 Pole Menggunakan Software Magnet Infolytica	Muhammad Afdhal Izzati
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ABSTRAK

Permanent Magnet Synchronous Generator (PMSG) dengan 12 slot 8 pole menggunakan perangkat *software Magnet Infolytica*. Fokus utama penelitian adalah mengevaluasi dampak perubahan lebar magnet permanen (32 mm hingga 52 mm) terhadap karakteristik elektromagnetik, seperti arus, tegangan, torsi, daya input, daya output, dan efisiensi konversi energi. Simulasi dilakukan pada kecepatan rotasi 750 rpm dengan beban resistif sebesar 70 Ohm. Hasil penelitian menunjukkan bahwa peningkatan lebar magnet permanen memberikan dampak positif terhadap performa PMSG, Generator tebaik pada variasi lebar magnet 44 mm yang memiliki efisiensi 88,6 % dengan arus sebesar 8,9 A, Tegangan sebesar 565,97 V, Torsi sebesar -66,08 N/m, Daya *input* sebesar 5189,79 Watt, dan terakhir daya *output* sebesar 4598,67 Watt . Temuan ini diharapkan dapat menjadi acuan dalam perancangan PMSG yang optimal untuk aplikasi pembangkit listrik energi terbarukan skala kecil hingga menengah, khususnya pada sistem Pembangkit Listrik Tenaga Bayu (PLTB).

Kata Kunci : *Permanen Magnet Synchoronous Generator*, Efisiensi, *Finite Element Method* ,Material Magnet Permanen

Title	*Analysis of the Effect of Neodymium Magnet Width on the Performance of a 12-Slot, 8-Pole Permanent Magnet Synchronous Generator (PMSG) Using Magnet Infolytica Software*	Muhammad Afdhal Izzati
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ABSTRACT

Permanent Magnet Synchronous Generator (PMSG) with 12 slots 8 poles using Magnet Infolytica software. The main focus of the research is to evaluate the impact of changes in the width of the permanent magnet (32 mm to 52 mm) on electromagnetic characteristics, such as current, voltage, torque, input power, output power, and energy conversion efficiency. Simulations were carried out at a rotational speed of 750 rpm with a resistive load of 70 Ohm. The results showed that increasing the width of the permanent magnet had a positive impact on the performance of the PMSG, the best generator at a variation of the magnet width of 44 mm which had an efficiency of 88.6% with a current of 8.9 A, a voltage of 565.97 V, a torque of -66.08 N/m, an input power of 5189.79 Watts, and finally an output power of 4598.67 Watts. These findings are expected to be a reference in designing an optimal PMSG for small to medium-scale renewable energy power generation applications, especially in Wind Power Generation (PLTB) systems.

Keywords: Permanent Magnet Synchoronous Generator, Efficiency, Finite Element Method Permanent Magnet Material