ABSTRACT

**THE APPLICATION OF MATHEMATICA MODELING ON WIND SPEED
TOWARDS GENERATOR USING FINITE DIFFERENCE METHOD**

By

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Mathematics is a science that always found wherever humans are. Mathematics can also help to solve problems in daily life. One of the mathematics sciences that is often used to solve problems is mathematical modeling. One of the real word phenomena in mathematical modeling is calculating wind values using the finite difference method. By using this method, the equation is modeled and the wind value is calculated by using four wind speed data in the city of Lampung province, such as North Lampung, South Lampung, Pesawaran, and Bandar Lampung. In this research, the values and wind equations at nine onther points between four regions in Lampung Province will be known using manual calculations and a simulation will be carried out using Lindo Software. With manual calculations the wind values at the nine points are $T_{c1} = 6,625$, $T_{c2} = 6,302$, $T_{c3} = 6,240$, $T_{c4} = 6,823$, $T_{c5} = 7,135$, $T_{c6} = 6,469$, $T_{c7} = 6,391$, $T_{c8} = 6,859$, dan $T_{c9} = 6,781$. The wind values at nine points in the Lampung Province area that is obtained based on Lindo Software simulation are $T_{c1} = 5,387$, $T_{c2} = 6,083$, $T_{c3} = 5,499$, $T_{c4} = 5,388$, $T_{c5} = 6,222$, $T_{c6} = 5,534$, $T_{c7} = 5,881$, $T_{c8} = 6,222$, dan $T_{c9} = 6,222$.

Key words: mathematics, finite difference, wind value.

ABSTRAK

APLIKASI PEMODELAN MATEMATIKA PADA LAJU ANGIN TERHADAP PEMBANGKIT LISTRIK MENGGUNAKAN METODE BEDA HINGGA

Oleh

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Matematika adalah ilmu yang selalu ditemukan dimanapun manusia berada. Matematika juga bisa membantu untuk memecahkan persoalan dalam kehidupan sehari-hari. Salah satu ilmu matematika yang sering digunakan untuk memecahkan persoalan-persoalan adalah pemodelan matematika. Fenomena dunia nyata dalam pemodelan matematika salah satunya adalah menghitung nilai angin menggunakan metode beda hingga. Dengan metode ini, dimodelkan persamaan dan dihitung nilai angin dengan menggunakan 4 data laju angin di empat kabupaten/kota di Provinsi Lampung yaitu Lampung Utara, Lampung Selatan, Pesawaran, dan Bandar Lampung. Dalam penelitian ini akan diketahui nilai dan persamaan angin di 9 titik lainnya diantara 4 daerah di Provinsi Lampung menggunakan perhitungan manual yaitu $T_{c1} = 6{,}625$, $T_{c2} = 6{,}302$, $T_{c3} = 6{,}240$, $T_{c4} = 6{,}823$, $T_{c5} = 7{,}135$, $T_{c6} = 6{,}469$, $T_{c7} = 6{,}391$, $T_{c8} = 6{,}859$, dan $T_{c9} = 6{,}781$. Berdasarkan simulasi di *Software Lindo* nilainya adalah $T_{c1} = 5{,}387$, $T_{c2} = 6{,}083$, $T_{c3} = 5{,}499$, $T_{c4} = 5{,}388$, $T_{c5} = 6{,}222$, $T_{c6} = 5{,}534$, $T_{c7} = 5{,}881$, $T_{c8} = 6{,}222$, dan $T_{c9} = 6{,}222$.

Kata kunci : matematika, beda hingga, nilai angin