

SKRIPSI

**OPERATOR NON NEGATIF DAN HUBUNGANNYA DENGAN
OPERATOR SELF-ADJOINT, NORMAL DAN INVERTIBLE PADA
RUANG HILBERT**

**NON NEGATIVE OPERATOR AND RELATION WITH SELF-ADJOINT,
NORMAL AND INVERTIBLE OPERATOR ON HILBERT SPACE**



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FAKULTAS SAINS DAN MATEMATIKA**

UNIVERSITAS DIPONEGORO

SEMARANG

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Diajukan untuk memenuhi salah satu syarat memperoleh derajat
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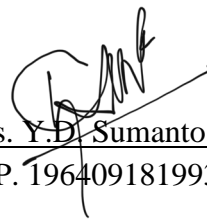


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ABSTRAK

**OPERATOR NON NEGATIF DAN HUBUNGANNYA DENGAN
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RUANG HILBERT**

Oleh

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Operator non negatif adalah salah satu jenis operator linier yang dikonstruksikan pada ruang Hilbert. Operator non negatif memiliki sifat bagian riil dari hasil kali dalam harus positif atau nol. Skripsi ini bertujuan untuk membahas secara teoritis tentang karakteristik dari operator non negatif pada ruang Hilbert serta membahas hubungan antara operator non negatif dengan operator self-adjoint, operator normal dan operator invertible. Untuk menyelidiki karakteristik operator non negatif dengan menggunakan definisi, contoh, lemma, teorema yang berkaitan dengan operator non negatif pada ruang Hilbert. Selanjutnya, untuk menyelidiki keterkaitan antara operator non negatif dengan operator self-adjoint, operator normal dan operator invertible diperlukan konsep operator self-adjoint, operator normal dan operator invertible pada ruang Hilbert. Hasil yang diperoleh adalah sifat-sifat operator non negatif diantaranya sifat penjumlahan, perkalian dengan skalar, komposisi, akar kuadrat, kombinasi linier dan hubungan operator non negatif dengan nilai eigen. Hubungan operator non negatif dengan operator self-adjoint, operator normal dan operator invertible adalah operator non negatif jika dan hanya jika operator self-adjoint, jika operator non negatif maka operator normal, dan jika operator non negatif maka operator invertible.

Kata kunci: Operator invertible, operator non negatif, operator normal, operator self-adjoint, ruang Hilbert.

ABSTRACT

NON NEGATIVE OPERATOR AND RELATION WITH SELF-ADJOINT, NORMAL AND INVERTIBLE OPERATOR ON HILBERT SPACE

By

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Non negative operator is a type of linear operator that is constructed on Hilbert space. Non negative operator has the property that the real part of the inner product must be positive or zero. This essay aims to discuss theoretically the characteristics of non negative operators on Hilbert space and discuss the relationship between non negative operator with self-adjoint operator, normal operator and invertible operator. To investigate the characteristics of non negative operator using definitions, example, lemma, theorem deals with non negative operator on Hilbert space. Furthermore, to investigate the relationship between non negative operator with self-adjoint operator, normal operator and invertible operator, the concept of self-adjoint operator, normal operator and invertible operator on Hilbert space is needed. The results obtained are non negative operator characteristics including addition properties, multiplication by scalar, composition, square root, linear combination and relation non negative operator with eigenvalues. The relationship between operator is non negative with self-adjoint operators, normal operator and invertible operator are non negative operator if and only if the operator is self-adjoint, if the operator is non negative then the operator is normal, and if the operator is non negative then the operator is invertible.

Keywords: Hilbert space, invertible operator, non negative operator, normal operator, self-adjoint operator.