

## **INTISARI**

# **EKSISTENSI DAN KETUNGGALAN SOLUSI LEMAH MASALAH DIRICHLET PERSAMAAN DIFERENSIAL PARSIAL LINEAR ELIPTIK ORDER DUA**

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Solusi lemah merupakan salah satu jenis penyelesaian persamaan diferensial parsial yang didasarkan pada derivatif distribusi. Khususnya, pendefinisian solusi lemah masalah Dirichlet persamaan diferensial parsial linear eliptik order dua pada himpunan bagian terbuka di  $\mathbb{R}^n$ , dibangun dari definisi dan karakteristik ruang Sobolev, di antaranya Teorema *Embedding* Sobolev dan Teorema *Embedding* Kompak. Lebih lanjut, dengan memanfaatkan Teorema Lax Milgram, Teorema Alternatif Fredholm dan Teorema Asas Maksimum, ditunjukkan syarat cukup untuk menjamin ketunggalan solusi lemah masalah Dirichlet.

## **ABSTRACT**

### **THE EXISTENCE AND UNIQUENESS OF WEAK SOLUTIONS OF DIRICHLET PROBLEMS FOR SECOND ORDER ELLIPTIC LINEAR PARTIAL DIFFERENTIAL EQUATIONS**

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The weak solution is one of solutions of the partial differential equations, that is generated from derivative of the distribution. In particular, the definition of a weak solution of the Dirichlet problem for second order linear elliptic partial differential equations on an open subset in  $\mathbb{R}^n$ , is constructed by the definition and the characteristics of Sobolev spaces, such as Sobolev Embedding Theorem and Compact Embedding Theorem. Furthermore, by using the Lax Milgram Theorem, Alternative Fredholm Theorem and Maximum Principle Theorem, we derived the sufficient conditions to ensure the uniqueness of the weak solution of Dirichlet problems.