

氏名	デニーイバナルハキム Denny Ivanal Hakim
所属	理工学研究科 数理情報科学専攻
学位の種類	博士(理学)
学位記番号	理工博 第250号
学位授与の日付	平成30年3月25日
課程・論文の別	学位規則第4条第1項該当
学位論文題名	Complex Interpolation of Generalized Morrey Spaces, Local Block Spaces, and Grand Lebesgue Spaces 一般化されたモレー空間, 局所ブロック空間およびグランドルベীগ空間の複素補間 (英文)
論文審査委員	主査 准教授 澤野 嘉浩 委員 教授 倉田 和浩 委員 教授 服部 久美子 委員 講師 田中 仁(筑波技術大学)

### 【論文の内容の要旨】

The main aim of this thesis is to present a theory about the complex interpolation of some function spaces related to Morrey spaces. This thesis consists of six chapters. In Chapter 1, we recall the definition of Morrey spaces and generalized Morrey spaces and we also mention inclusion between Morrey spaces and the results on the boundedness of some classical integral operators in Morrey spaces. In addition, we recall a known result and a counterexample on interpolation of linear operators on Morrey spaces in this chapter.

In Chapter 2, we recall the complex interpolation method and some useful lemmas related to this method. We present our results about the complex interpolation of generalized Morrey spaces in Chapter 3. We obtain the description of the first and second complex interpolation of generalized Morrey spaces. We show that the first complex interpolation of generalized Morrey spaces can be described as a proper closed subspace of generalized Morrey spaces. Meanwhile, the second complex interpolation of generalized Morrey spaces yields generalized Morrey spaces. We also give a description of complex interpolation between the generalized Morrey spaces and  $L^\infty$ . Our results in this chapter can be viewed as an extension of the complex interpolation results in Morrey spaces.

In Chapter 4, we discuss the complex interpolation of some closed subspaces of Morrey spaces satisfying the lattice property. Some examples of these subspaces are the closure in generalized Morrey spaces of  $L_c^\infty$ ,  $L_c^0$ , and  $L^\infty$  and also generalized Morrey spaces defined on a fixed bounded domain. We show that the first and second complex interpolation of these subspaces yield different spaces. In Chapter 5, we discuss local Morrey type spaces, local block spaces, and the first complex interpolation of local block spaces. We show that local block spaces behave well under the first complex interpolation method. To prove this result, we show that the associate space of general local Morrey-type spaces can be realized as certain block spaces. Lastly, we discuss the first and second complex interpolation of grand Lebesgue spaces in Chapter 6. We prove that the grand Lebesgue spaces are closed under second complex interpolation method. We also give an example where the first complex interpolation of grand Lebesgue spaces is strictly contained in the second complex interpolation of grand Lebesgue spaces.