学 位 論 文 内 容 の 要 旨

博士の専攻分野の名称　博士（理　学）　氏　名　　向　井　重　雄

学 位 論 文 題 名

Pfaffian Systems of Confluent Hypergeometric Functions of Two Variables
（2 変数合流型超幾何関数のパフィアン系）

We study Pfaffian systems of confluent hypergeometric functions of two variables with rank three and rank four. This paper is composed of two parts. In part I, we study Pfaffian systems of two variables with rank three by using rational twisted cohomology groups associated with Euler type integrals of these functions. We give bases of the cohomology groups, whose intersection matrices depend only on parameters. Each connection matrix of our Pfaffian systems admits a decomposition into five parts, each of which is the product of a constant matrix and a rational 1-form on the space of variables. In part II, we consider confluences of Euler type integrals expressing solutions to Appell's F_2 system of hypergeometric differential equations, and study systems of confluent hypergeometric differential equations of rank four of two variables. Our consideration is based on a confluence transforming the abelian group $(\mathbb{C}^{\times})^2$ to the Jordan group of size two. For each system obtained by our study, we give its Pfaffian system with a connection matrix admitting a decomposition into four or five parts, each of which is the product of a matrix depending only on parameters and a rational 1-form in two variables. We classify these Pfaffian systems under an equivalence relation. Any system obtained by our study is equivalent to one of Humbert's Ψ_1 system, Humbert's Ξ_1 system, and the system satisfied by the product of two Kummer's confluent hypergeometric functions.