NON-HOLONOMIC SYSTEM IN A SPACE OF HIGHER ORDER II. ON THE THEORY OF EXTENSORS ON THE SUBSPACE

By

Yoshie KATSURADA

Introduction The concept of the non-holonomic system in the higher order space has been already given by the present author [1][1], and many operations in the system has been studied too [2]. It is purpose of the present paper to treat the theory of extensors in a subspace of the higher order space under such the concept of the non-holonomic system. That is, we study, in §2 the operations introduced by A. KAWAGUCHI [3] in the exsurface and the expseudonormal defined in §1 and give the D-symbols of these operations. The same discussion is made for the excovariant differentiation in the space of the connection in §§3–4. In this paper we use certain of the ideas, notations and results given in the previous paper [1] without explanation.

The present author wishes to offer to Prof. A. KAWAGUCHI her thanks for his guidance.

§ 1 The exsurface and the expseudonormal. Let us give an m-dimensional subspace in the n-dimensional space by the parameter form

(1.1) $$x^i = x^i(u^{j'}) \qquad i=1, \cdots, n\,;\ j'=1, \cdots, m;\ m \leqq n$$

and differentiate (1.1) in succession along parameterized arc of class P in the subspace, then we have the following results: [2]

(1.2) $$\begin{cases} x'^i = \dfrac{\partial x^i}{\partial u^{j'}} u'^{j'} \\ x^{(2)i} = \dfrac{\partial x^i}{\partial u^{j'}} u^{(2)j'} + \dfrac{\partial^2 x^i}{\partial u^{i'} \partial u^{j'}} u^{(1)i'} u^{(1)j'} \\ \vdots \end{cases}$$

(1) Numbers in brackets refer to the references at the end of the paper.

(2) Throughout this paper, repeated lower case Latin indices call for summation 1 to n, while the summations indicated by repeated lower case Latin indices with prime are from 1 to m.