Infinitesimal Bending of a Subspace of a Space with Non-Symmetric Basic Tensor

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Abstract

In this work infinitesimal bending of a subspace of a generalized Riemannian space (with non-symmetric basic tensor) are studied. Based on non-symmetry of the connection, it is possible to define four kinds of covariant derivative of a tensor. We have obtained derivation formulas of the infinitesimal bending field and integrability conditions of these formulas (equations).

Key words: Generalized Riemannian space, infinitesimal bending, infinitesimal deformation, subspace.

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0 Introduction

0.1. A generalized Riemannian space $GR_N$ is a differentiable manifold, endowed with non-symmetric basic tensor $G_{ij}(x^1,\ldots,x^N)$ [2], whose symmetric part is $G_{ij}$, and antisymmetric part $G_{ij}^\wedge$.

By equations

$$x^i = x^i(u^1,\ldots,u^M) \equiv x^i(u^\alpha), \quad \text{rank}(B^i_\alpha) = M, \quad (B^i_\alpha = \partial x^i/\partial u^\alpha), \quad (0.1)$$

in local coordinates is defined a subspace $GR_M \subset GR_N$, with metric tensor

$$g_{\alpha\beta} = B^i_\alpha B^j_\beta G_{ij}, \quad (0.2)$$