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On a Local Embedding Theorem of Generalized-Mizohata Structures

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Introduction.

The purpose of this paper is to generalize the Hounie and Malagutti's local embedding theorem for Mizohata structures and to discuss their embedding theorem in the frame work of *Kuranishi.*

It is Treves who introduced the notion of Mizohata structures (cf. [Tr1]). Hounie and Malagutti developed Treves's theory and proved that; any formally integrable Mizohata structure is actually integrable if the Mizohata structure is strongly pseudoconvex and $\dim_{\mathbf{R}} M \geq 3$ (cf. [H-M]). This result reminds us of the CR-local embedding theorem (cf. [A2], [Ku3]), namely any formally integrable CR structure $(M, {}^{0}T'')$ is actually integrable if the CR structure $(M, {}^{0}T'')$ is strongly pseudoconvex and $\dim_{\mathbf{R}} M = 2n-1 \geq 7$. Furthermore, in many points, Mizohata structures quite resemble CR structures. Hence it seems quite reasonable to try to discuss both in one context. We, therefore, introduce a notion of a generalized complex manifold and consider a *regular* real hypersurface M, namely a submanifold with real codimension 1, which satisfies some conditions in a generalized complex manifold. Over this hypersurface, from the generalized complex manifold, naturally a structure (M, E_M) is induced as in the CR case, which we call a generalized-Mizohata structure. Like formally integrable CR structures, we introduce a notion of a formally integrable generalized-Mizohata structure, and consider the local embedding theorem. With these in mind, in a more general context, we would like to discuss a local embedding theorem of generalized-Mizohata structures, which covers Hounie and Malagutti's local embedding theorem, and the CR-local embedding theorem (see [Ku1], [Ku2], [Ku3]). For this purpose, we recall the proof of the local embedding theorem of CR-structures (cf. [A2]). The proof consists of the following three parts.

Part 1. Let f be a C^∞ local embedding of M into $\mathbf{C}^n$ at the reference point p_0. We set a neighborhood of p_0 by

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