Tôhoku Math. Journ.
34 (1982), 65-86.

ON GENERALIZED SIEGEL DOMAINS WITH EXPONENT $(c_1, c_2, \cdots, c_s)$, II

AKIO KODAMA*

(Received April 13, 1981)

Introduction. This is a continuation of our previous paper [3], and we retain the terminology and notations there.

As a natural generalization of the notion of generalized Siegel domains in $C^n \times C^m$ with exponent c due to Kaup, Matsushima and Ochiai [2], we introduced in [3] the notion of generalized Siegel domains in $C^n \times C^{m_1} \times C^{m_2} \times \cdots \times C^{m_s}$ with exponent $(c_1, c_2, \cdots, c_s)$. For a domain D in C^N, we shall denote by $\mathrm{Aut}(D)$ the group of all holomorphic transformations of D onto itself. Then we say that D is a sweepable domain if there exist a subgroup Γ of $\mathrm{Aut}(D)$ and a compact subset K of D such that $\Gamma \cdot K = D$. In [5], Vey investigated the structure of generalized Siegel domains in $C^n \times C^m$ with exponent c and gave an interesting characterization of Siegel domains of the first or the second kind in the sense of Pjateckii-Sapiro [4] among generalized Siegel domains. His results may be stated as follows:

THEOREM (Vey [5]). (A) *Let $\mathscr{D}$ be a sweepable generalized Siegel domain in $C^n \times C^m$ with exponent c. Then we have the following:*

(A-1) *If $c \neq 0$, then $\mathscr{D}$ is a Siegel domain of the first or the second kind according as $m = 0$ or $m > 0$.*

(A-2) *If $c = 0$, then $\mathscr{D}$ is the direct product $\mathscr{D}_1 \times \mathscr{D}_2$, where $\mathscr{D}_1$ is a Siegel domain of the first kind in C^n and $\mathscr{D}_2$ is a homogeneous bounded circular domain in C^m containing the origin.*

(B) *Let $\mathscr{D}$ be a generalized Siegel domain in $C^n \times C^m$ with exponent c. Suppose that $\mathscr{D}$ admits a discrete subgroup Γ of* $\mathrm{Aut}(\mathscr{D})$ *such that $\mathscr{D}/\Gamma$ is compact. Then $\mathscr{D}$ is symmetric.*

As a generalization of (A-1) of Vey's theorem, we proved the following theorem in [3]:

THEOREM I (Kodama [3]). *A sweepable generalized Siegel domain in $C^n \times C^{m_1} \times C^{m_2} \times \cdots \times C^{m_s}$ with exponent $(c_1, c_2, \cdots, c_s)$ with $c_i \neq 0$ for*

---

* Partly supported by the Grant-in-Aid for Scientific Research, the Ministry of Education, Science and Culture, Japan. Work also supported in part by the Sakkokai Foundation.