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ON THE STRUCTURE OF A BOUNDED DOMAIN WITH A SPECIAL BOUNDARY POINT, II

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Introduction. This is a continuation of our previous paper [10]. We shall establish some extensions of Wong's characterization [19] of the open unit ball $\mathcal{B}^n$ in $\boldsymbol{C}^n$. Also we generalize a theorem of Behrens [2] derived from our result [9], and finally improve our main theorem in [10].

As a generalization of the notion of strictly pseudoconvex domains with C^2-smooth boundaries, we introduced in [10] the notion of domains with piecewise C^2-smooth boundaries of special type (see section 1). Now Wong [19] has given characterizations of the open unit ball $\mathcal{B}^n$ in $\boldsymbol{C}^n$ among bounded strictly pseudoconvex domains with C^∞-smooth boundaries. Our first purpose of this paper is to show that analogous characterizations are still valid for our domains with piecewise C^2-smooth boundaries of special type. In fact, by a direct application of our result [10], we shall establish the following extension of the Wong's result [19]:

Theorem I. *Let D be a bounded domain in $\boldsymbol{C}^n (n>1)$ with piecewise C^2-smooth boundary of special type and let $Aut(D)$ be the Lie group of all biholomorphic automorphisms of D. Then the following statements are mutually equivalent:*

(i) *D is biholomorphically equivalent to $\mathcal{B}^n$.*
(ii) *D is homogeneous.*
(iii) *$Aut(D)$ is non-compact.*
(iv) *There exists a compact subset K of D such that $Aut(D)\cdot K=D$.*

Corollary 1. *Let D be a bounded domain in $\boldsymbol{C}^n (n>1)$ with piecewise C^2-smooth boundary of special type. We assume that the boundary ∂D of D is not C^2-smooth globally, that is, ∂D has a corner. Then $Aut(D)$ is compact.*

Corollary 2. *Let D be a bounded circular domain in $\boldsymbol{C}^n (n>1)$ with piecewise C^2-smooth, but not smooth, boundary of special type and assume $o\in D$, where o denotes the origin of $\boldsymbol{C}^n$. Then every element of $Aut(D)$ keeps o fixed and hence is linear.*

Next we assume that a complex manifold M can be exhausted by biholo-