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ON DETERMINING SETS FOR HOLOMORPHIC AUTOMORPHISMS

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ABSTRACT. We study sets K in the closure of a domain $D \subset \mathbf{C}^n$ such that, if an automorphism φ of D fixes each point of K, then φ is the identity mapping. A separate result is proved for the case that K lies entirely in the boundary of D.

1. Principal ideas. We begin by defining the central idea in this paper.

Definition 1.1. Let K be a subset of the closure $\overline{D}$ of a bounded domain $D \subset \mathbf{C}^n$. The set K is said to be a *determining subset* of $\overline{D}$ if, whenever g is an automorphism of D that is continuous up to the boundary of D and $g(k) = k$ for all $k \in K$, then g is the identity map of D.

In our previous paper [**1**] we considered K lying entirely in D (and automorphisms were not necessarily continuous up to the boundary). Our goal now is to study the situation when some, or all, of the points of K lie in the boundary of the domain D. Recall that, when the domain D is the disc in the plane, then two interior points are a determining set for automorphisms; but it takes three boundary points to be a determining set. Just examining the situation in one dimension, one might surmise that if the topology of the domain is more complicated (higher connectivity) then it takes fewer points to make a determining set. We would like to explore all these aspects in the discussions below.

We begin our work by investigating more generally what happens if some, but not all, points of K lie on the boundary ∂D. First we prove that a similar theorem to the one in [**1**] holds in the case that K consists of the same number $n + 1$ points and one of these is in D while the rest are on the boundary. In Theorem 1.2 we note that the

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