

Holomorphic functions with distinguished properties on infinite dimensional spaces

Thiago R. Alves*

The study of algebras of holomorphic functions is a classical topic in function theory. When the subject comes to holomorphic functions of infinitely many variables, new phenomena occur, in the sense that functions enjoying properties that are forbidden in the case of finitely many variables might exist. A central question is the existence, or not, of such functions and, in the positive case, it is usually a very difficult task to construct such functions. A cornerstone in this study was the construction, by Aron, Cole and Gamelin (1991), of a bounded holomorphic function on the open unit ball of an infinite dimensional complex Banach space that is continuously but not uniformly continuously extended to the closed unit ball (let us call such functions *Aron-Cole-Gamelin functions*). The main purpose of our talk is to present a method to construct holomorphic functions of infinitely many variables satisfying certain prescribed distinguished properties. For instance, we show how to construct Aron-Cole-Gamelin functions on certain open sets not necessarily the open unit ball. The method can be used to provide, in certain cases, large algebraic structures formed by such functions (up to the zero function, of course).

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*Universidade Federal do Amazonas, Manaus, Brazil, e-mail: tralves.math@gmail.com