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Zbl 1084.32012

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Holomorphic invariants for continuous bounded symmetric Reinhardt domains. (English)

Acta Sci. Math. 70, No. 3-4, 623-637 (2004).
http://www.math.u-szeged.hu/acta/

Let Ω be a locally compact Hausdorff space and $E = C_0(\Omega)$ the Banach space of continuous functions vanishing at infinity. An open subset D of E is called "continuous Reinhardt domain" if $g \in D$ whenever $f \in D$ and $g \in E$ with $|f(\omega)| \geq |g(\omega)|$ for all $\omega \in \Omega$. From now on let D be a continuous Reinhardt domain which is moreover symmetric and bounded.
In [Arch. Math. 8, 50–61 (2003; Zbl 1045.32025)] *L. L. Stacho* and *B. Zalar* showed that every such domain can be described in the following way: There is a partition of Ω into finite subsets Ω_i and a function $m : \Omega \to \mathbb{R}^+$ such that $D = \{f : Q(f)(\omega) < 1 \; \forall \omega \in \Omega\}$ where the operator Q is defined by $Q(f)(\omega) = \sum_\eta m(\eta)|f(\eta)|^2$ where the sum is taken over all η in the same class Ω_i as ω. The present article describes under which conditions a pair of a partition together with a function m gives rise to a symmetric continuous Reinhardt domain. In particular, one has to impose a continuity condition on the pair which guarantess that $Q(f)$ is a continuous function on Ω for all $f \in C_0(\Omega)$.
Finally the authors investigate when two such domains are linearly equivalent. They deduce some structure theorems, then give an example of two locally compact topological spaces Ω and $\tilde{\Omega}$ which are not homeomorphic although $C_0(\Omega)$ and $C_0(\tilde{\Omega})$ contain linearly equivalent continuous Reinhardt domains.

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Keywords : bounded symmetric domain; Reinhardt domain; unit balls in complex Banach spaces
Classification :
∗32M15 Symmetric spaces (analytic spaces)
58B12 Questions of holomorphy in infinite-dimensional manifolds
46G20 Infinite dimensional holomorphy