

İSTANBUL ANALYSIS SEMINARS

NEW APPROACHES TO HARTOGS' SEPARATE ANALYTICITY THEOREM FOR CR FUNCTIONS

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Abstract: The famous classical theorem of Hartogs states that a function which is separately analytic must be analytic. In the last 10 years, a few examples of a boundary version of this theorem have been proved by the speaker and others. The problem is formulated as follows: Let $D \subseteq \mathbb{C}^2$ be a domain (usually with real analytic boundary, and usually strictly convex). Let f be a function on the boundary of D , and suppose that for all horizontal and vertical slices (or almost all slices in the case of measurable functions) of the boundary, f has a holomorphic extension to the corresponding slice of the domain, D . Show that f has an extension to D which is holomorphic in both variables. This theorem fails for the unit ball, but is true for some other domains. It is not known whether the “CR Hartogs Theorem” is generally true. New methods of proof for new classes of domains are discussed, including a variational method which gives hope for proving a very general theorem.

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