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analytic disc

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Defines	closed analytic disc
Defines	boundary of a closed analytic disc
Defines	attached analytic disc

Definition. Let $D := \{z \in \mathbb{C} \mid |z| < 1\}$ be the open unit disc. A non-constant holomorphic mapping $\varphi: D \rightarrow \mathbb{C}^n$ is called an *analytic disc* in \mathbb{C}^n . The really refers to both the embedding and the image. If the mapping φ extends continuously to the closed unit disc \bar{D} , then $\varphi(\bar{D})$ is called a *closed analytic disc* and $\varphi(\partial D)$ is called the *boundary of a closed analytic disc*.

Analytic discs play in some sense a role of line segments in \mathbb{C}^n . For example they give another way to see that a domain $G \subset \mathbb{C}^n$ is pseudoconvex. See the Hartogs Kontinuitatssatz theorem.

Another use of analytic discs are as a technique for extending CR functions on generic manifolds [?]. The idea here is that you can always extend a function from the boundary of a disc to the inside of the disc by solving the Dirichlet problem.

Definition. A closed analytic disc φ is said to be *attached* to a set $M \subset \mathbb{C}^n$ if $\varphi(\partial D) \subset M$, that is if φ maps the boundary of the unit disc to M .

Analytic discs are also used for defining the Kobayashi metric and thus plays a role in the study of invariant metrics.

References

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- [2] Steven G. Krantz. , AMS Chelsea Publishing, Providence, Rhode Island, 1992.