On the holomorphic closure dimension of real analytic sets

Janusz Adamus(1), Rasul Shafikov(2)

(1) Department of Mathematics, The University of Western Ontario, London, Ontario N6A 5B7 Canada, and Institute of Mathematics, Jagiellonian University, Krakow, Poland,
(2) Department of Mathematics, The University of Western Ontario, London, Ontario N6A 5B7 Canada

We will present the main results of [1], concerning the geometry of real analytic sets in complex ambient spaces. Given a real analytic (or, more generally, semianalytic) set R in $\mathbb{C}^n$ (viewed as $\mathbb{R}^{2n}$), there is, for every $p \in \bar{R}$, a unique smallest complex analytic germ X_p that contains the germ R_p. We call $\dim_{\mathbb{C}} X_p$ the *holomorphic closure dimension* of R at p. We show that the holomorphic closure dimension of an irreducible R is constant on the complement of a closed proper analytic subset of R, and discuss the relationship between this dimension and the CR dimension of R along its regular locus.

A real submanifold M in $\mathbb{C}^n$ is called a CR manifold of CR dimension m, if the tangent space T_pM contains a complex linear subspace of dimension m, where m is independent of the point $p \in M$. For an irreducible real analytic set R of pure dimension, the holomorphic closure dimension is constant along a dense open subset of R. One can thus speak of the generic value of this dimension. We show that, if R is an irreducible real analytic set of pure dimension d, and generic holomorphic closure dimension h, then there exists a semianalytic subset Y of R, $\dim Y < d$, such that $R \setminus Y$ is a CR manifold of CR dimension $m = d - h$.

References

[1] J.Adamus, R. Shafikov, *On the holomorphic closure dimension of real analytic sets*, preprint arXiv:0804.4511 (2008).

Autor kontaktowy: Janusz Adamus
Adres e-mail autora kontaktowego: jadamus@uwo.ca

Autor referujacy: Janusz Adamus.