

The Complexity of CR Mappings

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We consider various ideas concerning the complexity of CR mappings. We provide a method for analyzing the variety X_f associated with a CR mapping f between CR manifolds in \mathbb{C}^n and \mathbb{C}^N . This variety is defined, in the real-analytic case, to be the set of pairs (w,v) in $\mathbb{C}^n \times \mathbb{C}^N$ such that $r'(f(z), v) = 0$ on $r(z,w)$ for defining functions r and r' . By polarization the variety contains the graph of f , but it is typically larger. In the case of spheres we provide an elegant computation for this variety that avoids differentiation with respect to the CR vector fields. In the case of spheres we also discuss how these ideas fit into a complexity issue for real polynomials with positive coefficients.

