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Perturbation by analytic discs along maximal real submanifolds of C^N . (English)

Zbl 0806.58044

Math. Z. 217, No. 2, 287-316 (1994).

Let Δ be the open unit disc in \mathbb{C} . Given a totally real submanifold M of \mathbb{C}^N of dimension N and a smooth map $p : b\Delta \rightarrow M$; we want to find smooth maps $\varphi : \overline{\Delta} \rightarrow C^N$, holomorphic on Δ which are close to the zero map and which satisfy $(p + \varphi)(b\Delta) \subset M$. For each $\zeta \in b\Delta$ let $T(\zeta)$ be the tangent space to M at $p(\zeta)$. In the cases considered the bundle $T = \{T(\zeta) : \zeta \in b\Delta\}$ is trivial. We introduce the partial indices of M along p as the partial indices of a vector Hilbert problem naturally associated with the bundle T , and the total index κ of M along p which is the sum of the partial indices. We show that if all partial indices of M along p are nonnegative then the family of maps φ above depends on $\kappa + N$ real parameters and this is still true for small perturbations of M . This generalizes a result of Forstnerič who studied the case when $N = 2$ and when $p = f|_{b\Delta}$ where $f : \overline{\Delta} \rightarrow \mathbb{C}^2$ is an immersed analytic disc [*F. Forstnerič*, Ann. Inst. Fourier 37, 1-44 (1987; Zbl 0583.32038)].

Reviewer: J.Globevnik (Ljubljana)

MSC:

37J40 Perturbations of finite-dimensional Hamiltonian systems, normal forms, small divisors, KAM theory, Arnol'd diffusion

Cited in **2** Reviews
Cited in **28** Documents

Keywords:

analytic discs; real submanifold; perturbations

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