

Normal forms of maps with linear parts having Jordan blocks

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ABSTRACT

We study the linearizability of biholomorphic maps of \mathbf{C}^n fixing the origin when the Jacobian matrix at the origin admits nontrivial Jordan blocks. We propose a sufficient nonexpansiveness condition for the linearizability of such maps in the case of a single Jordan block. The key to the proof is the decoupling of the homological equation into Siegel part and Poincaré part. An exponential diophantine condition (Bruno–Rüssmann type) is used to control small divisors in the Siegel part. When our condition on nonexpansiveness fails, we show that a quasi-resonance phenomena occurs and we give some evidence that even the linearized homological equation cannot be solved in general provided a nontrivial Jordan block is present. In higher dimensions ($n > 3$) new inhomogeneous diophantine conditions also appear.

Keywords: *normal form, diophantine condition, Jordan block, homological equation*

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