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The problem of local smooth linearization of systems of ordinary differential equations

The problem of local smooth linearization of systems of ordinary differential equations. An autonomous real infinitely smooth system of ordinary differential equations is considered near a nondegenerate singular point. We have obtained a condition on its normal form, which is sufficient for local linearization of the system by means of a k-smooth change of coordinates (the S(k) condition). This sufficient condition of k-smooth linearization is simultaneously necessary in the following cases: 1) singular point has a parabolic tipe; 2) dimension of space n=2; 3) k=1. If the system has a linear automorphism and satisfies the S(k) condition, then there exists the k-smooth linearization, which commutes with the automorphism. This work was supported by Russian Foundation of the Fundamental Research.