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Transformation of Families of Matrices to Normal Forms

Families of matrices, smoothly depending on a vector of parameters, are considered. V. I. Arnold has found normal forms of complex matrix families (miniversal deformations) to which any family of matrices can be transformed by change of basis, smoothly depending on the vector of parameters, and by smooth change of parameters. Normal forms of families of real matrices have been found by D. M. Galin. In the present paper a constructive method of determining functions describing change of basis and change of parameters, transforming arbitrary family to the miniversal deformation, is suggested. The procedure to determine these functions is shown to be convenient for numerical implementation. Numerical examples are presented.