

The role of the precise definition of stiffness in designing codes for the solution of ODEs *

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Abstract

The notion of *stiffness*, which originated in several applications of different nature, has dominated the activities related to the numerical treatment of differential problems in the last fifty years. On the contrary of what usually happens in Mathematics, its definition has been, for a long time, not formally precise (actually, there are too many of them). Again, the needs of applications, especially those rising in the construction of robust and general purpose codes, require nowadays a formally precise definition. A precise definition of stiffness has been recently introduced in [1]. We review the evolution of the concept of stiffness and we present the new definition which encompasses all the previous ones, together with examples of its use in codes for the solution of BVPs. Numerical examples which show that the new definition adequately describes the stiffness are reported,

References

- [1] L. Brugnano, F. Mazzia, D. Trigiante, Fifty Years of Stiffness, Annals of the European Academy of Sciences, in press.

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