

## Empirical study of a Padé type accelerating method of Picard iteration

OANA BUMBARIU and VASILE BERINDE

### ABSTRACT.

We use a Padé type acceleration technique for the method of successive approximations in [J. Biazar and A. Amirteimoori, *An improvement to the fixed point iterative method*, Applied Mathematics and Computation **182** (2006), 567-571, doi:10.1016/j.amc.2006.04.019] to empirically study the possibility of accelerating Picard iteration for some other known test functions.

### REFERENCES

- [1] Babolian, E. and Biazar, J., *On the order of convergence of Adomian method*, J. Appl. Math. Comput. **130** (2002), 383-387
- [2] Babu, G. V. R. and Vara Prasad, K. N. V. V., *Comparison of fastness of the convergence among Krasnoselskij, Mann and Ishikawa iterations in arbitrary real Banach spaces*, Fixed Point Theory and Appl., Volume 2006, Article ID 35704, 12 pages
- [3] Babu, G. V. R. and Vara Prasad, K. N. V. V., *Mann iteration converges faster than Ishikawa iteration for the class of Zamfirescu operators*, Fixed Point Theory and Applications, Volume 2006, Article ID 49615, 6 pages
- [4] Babu, G. V. R. and Vara Prasad, K. N. V. V., *Mann iteration converges faster than Ishikawa iteration for the class of Zamfirescu operators*, Fixed Point Theory and Applications, Volume 2007, Article ID 97986, 2 pages
- [5] Baker, G. A. Jr. and Graves-Morris, P., *Padé Approximants*, 2nd edition, in: Encyclopedia of Mathematics and its Applications, **59** (1996), Cambridge University Press, Cambridge
- [6] Berinde, V., *Iterative Approximation of Fixed Points*, 2nd Ed., Springer Verlag, Berlin Heidelberg New York, 2007
- [7] Berinde, V., *Picard iteration converges faster than Mann iteration for a class of quasi-contractive operators*, Fixed Point Theory and Applications **2004** (2004), No. 2, 97-105
- [8] Berinde, V. and Berinde, M., *The fastest Krasnoselskij iteration for approximating fixed points of strictly pseudo-contractive mappings*, Carpathian J. Math. **21** (2005), No. 1-2, 13-20
- [9] Biazar, J. and Amirteimoori, A., *An improvement to the fixed point iterative method*, Appl. Math. Comput. **182** (2006), 567-571
- [10] Brezinski, C., *Convergence acceleration during the 20th century*, in: Numerical Analysis 2000, Vol. II: 29 Interpolation and Extrapolation, J. Comput. Appl. Math. **122** (2000), No. 1-2, 1-21
- [11] Liang, Fang, Guoping, He, *Some modifications of Newton's method with higher-order convergence for solving nonlinear equations*, J. Comput. Appl. Math. **228** (2009) 296-303
- [12] Kou, J., Wang, X., Yitian, Li *Some eighth-order root-finding three-step methods*, Appl. Math. Lett. **23** (2009), 92-96
- [13] Mărușter Șt., *Metode numerice în rezolvarea ecuațiilor nelineare*, Editura Tehnică, Bucuresti, 1981
- [14] Ortega, J. M. and Rheinboldt, W. C., *Iterative Solution of Nonlinear Equations in Several Variables*, Academic Press, New York, 1970
- [15] Zhou, X., *A class of Newton's methods with third-order convergence* Appl. Math. Lett., **20** (2007), 1026-1030
- [16] Wang, X., Kou, J. and Yitian, Li, *Modified Jarratt method with sixth-order convergence*, Appl. Math. Lett., **22** (2009), 1798-1802

NORTH UNIVERSITY OF BAIA MARE  
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE  
VICTORIEI 76, 430122, BAIA MARE, ROMANIA  
E-mail address: vberinde@ubm.ro  
E-mail address: oanabumbariu@yahoo.com

Received: 14.03.2010; In revised form: 01.07.2010; Accepted: 15.08.2010.

2000 Mathematics Subject Classification. 47H10, 65B99.

Key words and phrases. Fixed point, Picard iterations, Padé type acceleration, order of convergence.