## HYERS-ULAM-RASSIAS STABILITY OF GENERALIZED CAUCHY FUNCTIONAL EQUATION

## ASGHAR RAHIMI

**Abstract.** In this paper, the Hyers-Ulam-Rassias stability of generalized Cauchy functional equation  $f(\alpha x + \beta y) = \alpha f(x) + \beta f(y), \ \alpha, \beta \in \mathbb{R} - \{0\}$ , for A-linear mapping over  $C^*$ -algebras will be investigate.

MSC 2010. 39B72, 47H09.

**Key words.** Hyers-Ulam-Rassias Stability, fixed point, additive mapping, contractive mapping, generalized Cauchy functional equation.

## REFERENCES

- AOKI, T., On the stability of the linear transformation in Banach spaces, J. Math. Soc. Japan, 2 (1950), 64–66.
- [2] CZERWIK, P., Functional equations and inequalities in several variables, World Scientific Publishing Company, New Jersey, Hong Kong, Singapore and London, 2002.
- [3] GAJDA, Z., On the stability of additive mappings, Int. J. Math. Math. Sci., 14 (1991), 431–434.
- [4] GAVRUTA, P., A generalization of the Hyers-Ulam-Rassias stability of approximately additive mappings, J. Math. Anal. Appl., 184 (1994), 431–436.
- [5] HYERS, D.H., On the stability of the linear functional equation, Proc. Nat. Acad. Sci. U.S.A., 27 (1941), 222–224.
- [6] ISAC, G. and RASSIAS, TH. M., Stability of Ψ-additive mappings: applications to nonlinear analysis, Int. J. Math. Math. Sci., 19 (1996), 219–228.
- [7] JUNG, S.-M., Hyers-Ulam-Rassias stability of functional equations in mathematical analysis, Hadronic Press Inc., Palm Harbor, Florida, 2001.
- [8] MARGOLIS, B. and DIAZ, J.B., A fixed point theorem of the alternative for contractions on a generalized complete metric space, Bull. Amer. Math. Soc., 74 (1968), 305–309.
- [9] MOSLEHIAN, M.S. and RASSIAS, TH.M., Stability of functional equations in non-Archimedian spaces, Appl. Anal. Disc. Math., 1 (2007), 325–334.
- [10] NAJATI, A., Hyers-Ulam stability of an n-Apollonius type quadratic mapping, Bull. Belg. Math. Soc. Simon Stevin, 14 (2007), 755–774.
- [11] NAJATI, A., On the stability of a quartic functional equation, J. Math. Anal. Appl., 340 (2008), 569–574.
- [12] NAJATI, A. and RAHIMI, A., A fixed point approach to the stability of a generalized Cauchy functional equation, Banach J. Math. Anal. Appl., 2 (1) (2008), 105–112.
- [13] NAJATI, A. and RAHIMI, A., Homomorphisms between C<sup>\*</sup>-algebras and their stabilities, Acta Univ. Apulensis, 19 (2009), 35–46
- [14] RASSIAS, TH.M., On the stability of the linear mapping in Banach spaces, Proc. Amer. Math. Soc., 72 (1978), 297–300.
- [15] RASSIAS, TH.M., Functional equations, inequalities and applications, Kluwer Academic Publishers Co., Dordrecht, Boston, London, 2003.
- [16] ULAM, S.M., A collection of the mathematical problems, Interscience Publ., New York, 1960.

University of Maragheh Faculty of Basic Science Department of Mathematics Maragheh, Iran E-mail: asgharrahimi@yahoo.com