

ON THE HYERS–ULAM–RASSIAS STABILITY OF AN n -DIMENSIONAL PEXIDERIZED QUADRATIC EQUATION

KIL-WOUNG JUN, JAE-HYEONG BAE AND YANG-HI LEE

Abstract. In this paper we prove the stability of an n -dimensional Pexiderized quadratic equation $f_1(\sum_{i=1}^n x_i) + \sum_{1 \leq i < j \leq n} f_{\alpha(i,j)}(x_i - x_j) = n \sum_{i=1}^n f_{\beta(i)}(x_i)$ in the spirits of Hyers, Ulam and Rassias.

Mathematics subject classification (2000): 39B72, 47H15.

Key words and phrases: Quadratic function, Hyers-Ulam-Rassias stability, Pexiderized Euler-Lagrange equation.

REFERENCES

- [1] C. BORELLI AND G. L. FORTI, *On a general Hyers-Ulam-stability result*, Internat. J. Math. Math. Sci. **18** (1995), 229–236.
- [2] P. W. CHOLEWA, *Remarks on the stability of functional equations*, Aequationes Math. **27** (1984), 76–86.
- [3] S. CZERWIK, *On the stability of the quadratic mapping in normed spaces*, Abh. Math. Sem. Univ. Hamburg. **62** (1992), 59–64.
- [4] P. GÄVRUTA, *A generalization of the Hyers-Ulam-Rassias stability of approximately additive mappings*, J. Math. Anal. and Appl. **184** (1994), 431–436.
- [5] D. H. HYERS, *On the stability of the linear functional equation*, Proc. Nat. Acad. Sci. U.S.A. **27** (1941), 222–224.
- [6] D. H. HYERS, G. ISAC AND TH. M. RASSIAS, “*Stability of Functional Equations in Several Variables*”, Birkhäuser (1998).
- [7] D. H. HYERS AND TH. M. RASSIAS, *Approximate homomorphisms*, Aeq. Math. **44** (1992), 125–153.
- [8] K. -W. JUN AND Y. -H. LEE, *On the Hyers-Ulam-Rassias stability of a generalized quadratic equation*, Bull. Korean Math. Soc. **38** (2001), 261–272.
- [9] K. -W. JUN AND Y. -H. LEE, *On the Hyers-Ulam-Rassias stability of a Pexiderized quadratic inequality*, Math. Ineq. Appl. **4** (2001), 93–118.
- [10] K. -W. JUN, D.-S. SHIN AND B. -D. KIM, *On Hyers-Ulam-Rassias stability of the pexider equation*, J. Math. Anal. Appl. **239** (1999), 20–29.
- [11] S.-M. JUNG, *On the Hyers-Ulam stability of the functional equations that have the quadratic property*, J. Math. Anal. Appl. **222** (1998), 126–137.
- [12] S.-M. JUNG, *On the Hyers-Ulam-Rassias stability of a quadratic functional equation*, J. Math. Anal. Appl. **232** (1999), 384–393.
- [13] PL. KANNAPPAN, *Quadratic functional equation and inner product spaces*, Results Math. **27** (1995), 368–372.
- [14] Y. -H. LEE AND K. -W. JUN, *A generalization of the Hyers-Ulam-Rassias stability of Pexider equation*, J. Math. Anal. Appl. **246** (2000), 627–638.
- [15] Y. -H. LEE AND K. -W. JUN, *A note on the Hyers-Ulam-Rassias stability of Pexider equation*, J. Korean Math. Soc. **37** (2000), 111–124.
- [16] J. M. RASSIAS, *On the stability of the Euler-Lagrange functional equation*, Chinese J. Math. **20** (1992), 185–190.

- [17] TH. M. RASSIAS, *On the stability of the linear mapping in Banach spaces*, Proc. Amer. Math. Soc. **72** (1978), 297–300.
- [18] TH. M. RASSIAS, *Stability and set-valued functions*, in: Analysis and Topology, World Scientific Publ. Co., 1988, pp. 585–614.
- [19] TH. M. RASSIAS, *On the stability of the quadratic functional equation and its applications*, Studia Univ. “Babes-Bolyai” **XLIII (3)** (1998), 89–124.
- [20] TH. M. RASSIAS, *Functional equations and inequalities*, Kluwer Academic Publishers, Dordrecht, 2000.
- [21] TH. M. RASSIAS, *On the stability of functional equations and a problem of Ulam*, Acta Math. **62** (2000), 23–130.
- [22] TH. M. RASSIAS, *On the stability of functional equations in Banach spaces*, J. Math. Anal. Appl. **251** (2000), 264–284.
- [23] TH. M. RASSIAS, *On the stability of the quadratic functional equation*, Mathematica, XLV(2) (2000), 77–114.
- [24] F. SKOF, *Proprietà locali e approssimazione di operatori*, Rend. Sem. Mat. Fis. Milano **53** (1983), 113–129.
- [25] S. M. ULAM, “*Problems in Modern Mathematics*”, Chap. VI, Wiley, New York, 1960.