Mathematical
Inequalities
& Applications
Volume 6, Number 4 (2003), 675–688

ON THE STABILITY OF HOMOGENEOUS FUNCTIONAL EQUATIONS WITH DEGREE t AND n–VARIABLES

GWANG HUI KIM

Abstract. In this paper, we obtain a generalization of Hyers-Ulam-Rassias stability for the family of the functional equation $f(\circ(x_1,x_2\cdots,x_n)) = H\left(f(x_1)^{\frac{1}{t}},f(x_2)^{\frac{1}{t}},\cdots,f(x_n)^{\frac{1}{t}}\right)$, where H is a homogeneous function of degree t and $\circ$ is an n-times-symmetric operation on the set S. As a consequence we can obtain the Hyers-Ulam stability.

Mathematics subject classification (2000): 39B52, 39B72, 39B82.

Key words and phrases: Functional equation, homogeneous function, Hyers-Ulam stability, Hyers-Ulam-Rassias stability.

REFERENCES

[1] P. GĂVRUTA, *A generalization of the Hyers-Ulam-Rassias stability of approximately additive mappings*, J. Math. Anal. Appl. **184** (1994), 431–436.
[2] R. GER, *Superstability is not natural*, Roczik Naukowo-Dydaktyczny WSP w Krakowie, Prace Mat. **159** (1993), 109–123.
[3] D. H. HYERS, *On the stability of the linear functional equation*, Proc. Nat. Acad. Sci. U.S.A. **27** (1941), 222–224.
[4] D. H. HYERS, G. ISAC AND TH. M. RASSIAS, *Stability of the Functional Equations in Several Variables*, Birkhäuser Verlag (1998).
[5] D. H. HYERS AND TH. M. RASSIAS, *Approximate homomorphisms*, Aequationes Math. **44** (1992), 125–153.
[6] G. H. KIM, *On the stability of functional equations with square-symmetric operations*, Math. Ineq. Appl. **4, No 2** (2001), 257–266.
[7] ZSOLT PÁLES, *Generalized stability of the Cauchy functional equation*, Aequationes Math. **56** (1998), 222–232.
[8] ZSOLT PÁLES, PETER VOLKMANN AND DUNCAN LUCE, *Stability of Functional Equations with Square-Symmetric Operations*, Proc. Natl. Acad. Sci. **95,** Issue 22 (1998), 12772–12775.
[9] TH. M. RASSIAS, *On the stability of the linear mapping in Banach spaces*, Proc. Amer. Math. Soc. **72** (1978), 297–300.
[10] TH. M. RASSIAS, *On the modified Hyers-Ulam sequence*, J. Math. Anal. Appl. **158** (1991), 106–113.
[11] TH. M. RASSIAS AND P. ŠEMRL, *On the behavior of mappings which do not satisfy Hyers-Ulam stability*, Proc. Amer. Math. Soc. **114** (1992), 989–993.
[12] S. M. ULAM, *"Problems in Modern Mathematics" Chap. VI*, Science editions, Wiley, New York (1964).

Paper MIA-06-61