HYERS–ULAM TYPE STABILITY OF JENSEN
OPERATORS IN LOCALLY CONVEX CONES

ISMAIL NIKOUFAR AND ASGHAR RANJBARI

Abstract. In the theory of locally convex cones, some methods are rather technical. This is the consequence of including infinity-type unbounded elements and the general non-availability of the cancellation law. In this paper, we consider the Hyers-Ulam stability problem in locally convex cones and prove the stability of Jensen operators in locally convex cones.

Mathematics subject classification (2020): 46A03, 39B82, 39B52.
Keywords and phrases: Locally convex cone, Jensen operator, stability.

REFERENCES

[1] T. AOKI, *On the stability of the linear transformation in Banach spaces*, J. Math. Soc. Japan. **2** (1950), 64–66.
[2] D. AYASEH AND A. RANJBARI, *Bornological Locally Convex Cones*, Matematiche (Catania) **69** (2) (2014), 267–284.
[3] C. BAAK, *Cauchy-Rassias stability of Cauchy-Jensen additive mappings in Banach spaces*, Acta Math. Sin. **22** (6) (2006), 1789–1796.
[4] M. DASHTI AND H. KHODAEI, *Stability of generalized multi-quadratic mappings in Lipschitz spaces*, Results Math. **74**, 163 (2019), 1–13.
[5] IZ. EL-FASSI, *On approximation of approximately generalized quadratic functional equation via Lipschitz criteria*, Quaest. Math. **42** (5) (2019), 651–663.
[6] IZ. EL-FASSI, *A new fixed point theorem in quasi-$(2,\beta)$-Banach spaces and some of its applications to functional equations*, J. Math. Anal. Appl. **512** (2022), 126–158.
[7] V. FAZIEV AND P. K. SAHOO, *On the stability of Jensen's functional equation on groups*, Proc. Indian Acad. Sci. Math. Sci. **117** (2007), 31–48.
[8] M. ESHAGHI GORDJI, T. KARIMI, AND S. K. GHARETAPEH, *Approximately n-Jordan homomorphisms on Banach algebras*, J. Inequal. Appl. **2009**, Article ID 870843 (2009), 1–8.
[9] M. ESHAGHI GORDJI, *Nearly ring homomorphisms and nearly ring derivations on non-Archimedean Banach algebras*, Abstr. Appl. Anal. **2010**, Article ID 393247 (2010), 1–12.
[10] M. ESHAGHI GORDJI AND A. FAZELI, *Stability and superstability of homomorphisms on C^*-ternary algebras*, An. Ştiinţ. Univ. "Ovidius" Constanţa Ser. Mat. **20** (1) (2012), 173–188.
[11] P. GĂVRUTA, *A generalization of the Hyers-Ulam-Rassias stability of approximately additive mappings*, J. Math. Anal. Appl. **184** (1994), 431–436.
[12] D. H. HYERS, *On the stability of the linear functional equation*, Proc. Natl. Acad. Sci. USA **27** (1941), 222–224.
[13] D. H. HYERS AND TH. M. RASSIAS, *Approximate homomorphisms*, Aequationes Math. **44** (1992), 125–153.
[14] S.-M. JUNG, *Hyers-Ulam-Rassias stability of Jensen's equation and its application*, Proc. Amer. Math. Soc. **126** (1998), 3137–3143.
[15] K. JUN AND Y. LEE, *A generalization of the Hyers-Ulam-Rassias stability of Jensen's equation*, J. Math. Anal. Appl. **238** (1999), 305–315.
[16] H.-M. KIM, I.-S. CHANG, AND E. SON, *Stability of Cauchy additive functional equation in fuzzy Banach spaces*, Math. Inequal. Appl. **16** (2013), 1123–1136.

[17] K. KEIMEL AND W. ROTH, *Ordered cones and approximation*, Lecture Notes in Mathematics **1517**, Springer-Verlag, Berlin, 1992.

[18] H. KHODAEI, *Asymptotic behavior of n-Jordan homomorphisms*, Mediterr. J. Math. **17**, 143 (2020), 1–9.

[19] Z. KOMINEK, *On a local stability of the Jensen functional equation*, Demonstr. Math. **22** (1989), 499–507.

[20] L. LI, J. CHUNG AND D. KIM, *Stability of Jensen equations in the space of generalized functions*, J. Math. Anal. Appl. **299** (2004), 578–586.

[21] Y.-H. LEE AND K.-W. JUN, *A generalization of the Hyers-Ulam-Rassias stability of Jensen's equation*, J. Math. Anal. Appl. **238** (1999), 305–315.

[22] M. S. MOSLEHIAN AND H. M. SRIVASTAVA, *Jensen's functional equation in multi-normed spaces*, Taiwanese J. Math. **14** (2) (2010), 453–462.

[23] A. NAJATI, *Cauchy-Rassias stability of homomorphisms associated to a Pexiderized Cauchy-Jensen type functional equation*, J. Math. Inequal. **3** (2) (2009), 257–265.

[24] A. NAJATI AND A. RANJBARI, *Stability of homomorphisms for a 3D Cauchy-Jensen type functional equation on C^*-ternary algebras*, J. Math. Anal. Appl. **341** (2008), 62–79.

[25] I. NIKOUFAR, *Superstability of m-additive maps on complete non-Archimedean spaces*, Sahand Commun. Math. Anal. **2** (1) (2015), 19–25.

[26] I. NIKOUFAR, *Approximate tri-quadratic functional equations via Lipschitz conditions*, Math. Bohem. **142** (4) (2017), 337–344.

[27] I. NIKOUFAR, *Behavior of bi-cubic functions in Lipschitz spaces*, Lobachevskii J. Math. **39** (2018), 803–808.

[28] I. NIKOUFAR, *Stability of multi-quadratic functions in Lipschitz spaces*, Iran. J. Sci. Technol. Trans. A Sci. **43** (2019), 621–625.

[29] I. NIKOUFAR AND A. RANJBARI, *Stability of linear operators in locally convex cones*, Bull. Sci. Math. **191**, 103380 (2024), 1–9.

[30] C.-G. PARK, *Lie *-homomorphisms between Lie C^*-algebras and Lie *-derivations on Lie C^*-algebras*, J. Math. Anal. Appl. **293** (2004), 419–434.

[31] A. RANJBARI AND H. SAIFLU, *Some results on boundedness in locally convex cones*, Bull. Iranian Math. Soc. **35** (1) (2009), 49–60.

[32] TH. M. RASSIAS, *On the stability of the linear mapping in Banach spaces*, Proc. Amer. Math. Soc. **72** (1978), 297–300.

[33] J. M. RASSIAS, *On approximation of approximately linear mappings by linear mappings*, J. Funct. Anal. **46** (1) (1982), 126–130.

[34] W. ROTH, *Operator-valued measures and integrals for cone-valued functions*, Lecture Notes in Mathematics **1964**, Springer-Verlag, Berlin, 2009.

[35] T. TRIF, *Hyers-Ulam-Rassias stability of a Jensen type functional equation*, J. Math. Anal. Appl. **250** (2000), 579–588.

[36] S. M. ULAM, *Problems in Modern Mathematics*, Science Editions, Wiley, New York, 1964.

Journal of Mathematical Inequalities
www.ele-math.com
jmi@ele-math.com