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Bihom derivations in Banach algebras. (English) Zbl 1441.46034

Summary: In this paper, we introduce bihom derivations in complex Banach algebras. Using the fixed point method and the direct method, we prove the Hyers-Ulam stability of bihom derivations in complex Banach algebras, associated with the bi-additive $s$-functional inequality

$$\|f(x+y, z-w) + f(x-y, z+w) - 2f(x, z) + 2f(y, w)\| \leq \|s(2f\left(\frac{x+y}{2}, z-w\right) + 2f\left(\frac{x-y}{2}, z+w\right) - 2f(x, z) + 2f(y, w))\|,$$

where $s$ is a fixed nonzero complex number with $|s| < 1$.

MSC:
46H25 Normed modules and Banach modules, topological modules (if not placed in 13-XX or 16-XX)
46H05 General theory of topological algebras
39B52 Functional equations for functions with more general domains and/or ranges
47B47 Commutators, derivations, elementary operators, etc.

Keywords:
bihom-biderivation; complex Banach algebra; Hyers-Ulam stability; fixed point method; bi-additive $s$-functional inequality

Full Text: DOI

References:
   · doi:10.1007/s11784-018-0547-0


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   · doi:10.1007/s00025-015-0457-z

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