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خلاصه مقاله:

For the Fr\'{e}chet algebras $(A, (p_k))$ and $(B, (q_k))$ and $n \in \mathbb{N}, n\geq ۲$, a linear map $T:A \rightarrow B$ is called \textit{almost n-multiplicative}, with respect to (p_k) and (q_k), if there exists $\varepsilon\geq ۰$ such that $q_k(Ta_۱a_۲\cdots a_n-Ta_۱Ta_۲\cdots Ta_n)\leq \varepsilon p_k(a_۱) p_k(a_۲)\cdots p_k(a_n)$, for each $k\in \mathbb{N}$ and $a_۱, a_۲, \ldots, a_n\in A$. The linear map T is called \textit{weakly almost n-multiplicative}, if there exists $\varepsilon\geq ۰$ such that for every $k\in \mathbb{N}$ there exists $n(k)\in \mathbb{N}$ with $q_k(Ta_۱a_۲\cdots a_n-Ta_۱Ta_۲\cdots Ta_n)\leq \varepsilon p_{n(k)}(a_۱) p_{n(k)}(a_۲)\cdots p_{n(k)}(a_n)$, for each $k \in \mathbb{N}$ and $a_۱, a_۲, \ldots, a_n\in A$. The linear map T is called n-multiplicative if $Ta_{۱}a_{۲} \cdots a_{n} = Ta_{۱} Ta_{۲} \cdots Ta_{n}$, for every $a_{۱}, a_{۲},\ldots, a_{n} \in A$. In this paper, we investigate automatic continuity of (weakly) almost n-multiplicative maps between certain classes of Fr\'{e}chet algebras, including Banach algebras. We show that if $(A, (p_k))$ is a Fr\'{e}chet algebra and $T: A \rightarrow \mathbb{C}$ is a weakly almost n-multiplicative linear functional, then either T is n-multiplicative, or it is continuous. Moreover, if $(A, (p_k))$ and $(B, (q_k))$ are Fr\'{e}chet algebras and $T:A \rightarrow B$ is a continuous linear map, then under certain conditions T is weakly almost n-multiplicative for each $n\geq ۲$. In particular, every continuous linear functional on A is weakly almost n-multiplicative for each $n\geq ۲$.

کلمات کلیدی:

multiplicative maps (homomorphisms), Almost multiplicative maps, automatic continuity, Frechet algebras, Banach algebras

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