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González, S. [González Jiménez, Santos] (E-ZRGZ);
Martínez, C. [Martínez López, Consuelo] (E-ZRGZ)
Bernstein algebras with zero derivation algebra. (English summary)
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In this paper the authors study finite-dimensional Bernstein algebras with zero derivation algebra. A commutative algebra A over a field K is a Bernstein algebra if it has a homomorphism $\omega\colon A\to K$ satisfying $(x^2)^2=\omega(x)^2x^2$. Let $A=Ke\oplus U_e\oplus Z_e$ be the Peirce decomposition of A with respect to an idempotent e, where $U_e=\{x\in \ker\omega\colon\ ex=\frac{1}{2}x\}$ and $Z_e=\{x\in\ker\omega\colon\ ex=0\}$. An endomorphism d of A is a derivation of A if $d(xy)=d(x)y+xd(y)$ for all $x,y\in A$.

The essential result of this paper is the following: If A is a Bernstein algebra with zero derivation algebra, then $\ker\omega$ is not nilpotent, i.e., A is not a genetic algebra. Using examples the authors give necessary conditions for the derivation algebra to be zero. Does it hold that, for a Bernstein algebra A satisfying $\operatorname{Der} A=0$, one has $Z_e^2\neq 0$ for every idempotent e? The authors give a negative answer in the case in which $U_e^2=0$. But the question remains open for $U_e^2\neq 0$. No characterization of Bernstein algebras satisfying $\operatorname{Der} A=0$ has been given. *Moussa Ouattara*