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Derivations in some Bernstein algebras of order 2. (English summary)
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If K is a field, $\mathrm{ch}(K) \neq 2$, a second-order Bernstein algebra A is a commutative K-algebra with a nonzero homomorphism of algebras $\omega\colon A \to K$ that satisfies the identity $((x^2)^2)^2 = \omega(x)^4(x^2)^2$. These algebras always have idempotent elements and for each of them, $e = e^2 \in A$, there is a Peirce decomposition $A = Ke \oplus U \oplus V$, where $U \oplus V = N = \mathrm{Ker}\,\omega$, $U = \{x \in N \mid ex = \frac{1}{2}x\}$, $V = \{x \in N \mid e(ex) = 0\}$. If $U = 0$, the algebra is called exceptional. It is known that this property does not depend on the partial idempotent element e.

The classes of Bernstein algebras of order 2, the exceptional ones and those that are power-associative, are considered in this paper. It is proved that in each of these classes a derivation D of A defines and is defined by a triple (u, f, g), where $u = D(e) \in U$, and $f\colon U \to U$, $g\colon V \to V$ are linear maps. It was proved by M. A. García-Muñiz in ["Derivations in Bernstein algebras of order 2", Doctoral Dissertation, Univ. de Oviedo, Oviedo, 1996; per revr.], that this is always the case for a second-order Bernstein algebra.

Linear maps associated with Peirce decompositions with respect to two different idempotent elements are called "Peirce transformations". It is also proved in the paper that these linear maps are algebra homomorphisms for second-order Bernstein algebras that are simultaneously power-associative and exceptional. *Santos González*