THE HOM-ASSOCIATIVE WEYL ALGEBRAS IN PRIME CHARACTERISTIC

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ABSTRACT. We introduce the first hom-associative Weyl algebras over a field of prime characteristic as a generalization of the first associative Weyl algebra in prime characteristic. First, we study properties of hom-associative algebras constructed from associative algebras by a general "twisting" procedure. Then, with the help of these results, we determine the commuter, center, nuclei, and set of derivations of the first hom-associative Weyl algebras. We also classify them up to isomorphism, and show, among other things, that all nonzero endomorphisms on them are injective, but not surjective. Last, we show that they can be described as a multi-parameter formal hom-associative deformation of the first associative Weyl algebra, and that this deformation induces a multi-parameter formal hom-Lie deformation of the corresponding Lie algebra, when using the commutator as bracket.

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