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Let U_1 and W_1 denote the Lie algebras of derivations of the Laurent polynomial algebra $K[t, t^{-1}]$ and the polynomial ring $K[t]$, respectively. Both algebras are naturally $\mathbb{Z}_i$ -graded. Although these structures have been studied since the twentieth century and have important applications in physics, concrete results concerning their graded identities have only been obtained recently. In particular, Freitas, Koshlukov, and Krasilnikov (2015) determined a basis for the $\mathbb{Z}$ -graded identities of W_1 in characteristic zero, while Fideles and Koshlukov in (2022) and (2023) determined the $\mathbb{Z}$ -graded identities of U_1 and W_1 in positive characteristic. In this work, we investigate the $\mathbb{Z}_i$ -graded identities of these algebras over a field of characteristic 2. As a consequence, we obtain a basis for their ordinary identities in characteristic 2, thereby partially solving a long-standing open problem, and we calculate their codimension sequences. Furthermore, we show that these algebras generate the variety of metabelian Lie algebras in characteristic 2.

Trabajo en conjunto con Claudemir Fideles (Universidade Estadual de Campinas).

Referencias

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