

Irreducible modules over finite simple Lie pseudoalgebras IV. Non-primitive pseudoalgebras

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Abstract. Let $\mathfrak{d} \subset \mathfrak{d}'$ be finite-dimensional Lie algebras, $H = U(\mathfrak{d})$, $H' = U(\mathfrak{d}')$ the corresponding universal enveloping algebras endowed with the canonical cocommutative Hopf algebra structure. We show that if L is a primitive Lie pseudoalgebra over H then all finite irreducible $L' = \text{Cur}_H^{H'}$ L -modules are of the form $\text{Cur}_H^{H'} V$, where V is an irreducible L -module, with a single class of exceptions. Indeed, when $L \simeq H(\mathfrak{d}, \chi, \omega)$, we introduce non-current L' -modules $\mathcal{V}_{\chi, \omega, t, \mathfrak{d}'}^H(R)$ that are obtained by modifying the current pseudoaction with an extra term depending on an element $t \in \mathfrak{d}' \setminus \mathfrak{d}$, which must satisfy some technical conditions. This, along with results from [2–4], completes the classification of finite irreducible modules of finite simple Lie pseudoalgebras over the universal enveloping algebra of a finite-dimensional Lie algebra.

Mathematics Subject Classification (2020): 17B35 (primary); 16W30, 17B81 (secondary).