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On the homology of free Lie algebras

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Abstract: Given a principal ideal domain R of characteristic zero, containing $1/2$, and a connected differential non-negatively graded free finite type R-module V, we prove that the natural arrow $\mathbb{L}FH(V) \to FH\mathbb{L}(V)$ is an isomorphism of graded Lie algebras over R, and deduce thereby that the natural arrow $UFH\mathbb{L}(V) \to FHU\mathbb{L}(V)$ is an isomorphism of graded cocommutative Hopf algebras over R; as usual, F stands for free part, H for homology, $\mathbb{L}$ for free Lie algebra, and U for universal enveloping algebra. Related facts and examples are also considered.

Keywords: differential graded Lie algebra, free Lie algebra on a differential graded module, universal enveloping algebra
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