Title: ℤ-graded Hom-Lie superalgebras

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In this paper, we introduce the notion of ℤ-graded Hom-Lie superalgebras, and we show that there is a maximal (resp., minimal) ℤ-graded Hom-Lie superalgebra for a given local Hom-Lie superalgebra. Morever, we introduce the invariant bilinear forms on a ℤ-graded Hom-Lie superalgebra and prove that a consistent supersymmetric α-invariant form on the local part can be extended uniquely to a bilinear form with the same property on the whole ℤ-graded Hom-Lie superalgebra. Furthermore, we check the condition in which the ℤ-graded Hom-Lie superalgebra is simple.

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