

© 2020 Heldermann Verlag  
Journal of Lie Theory 30 (2020) 239–257

**S. Hou**

Dept. of Mathematics, Jilin University, Changchun 130012, P. R. China  
and: College of Mathematics and Information Science, Hebei University, Baoding 071002,  
P. R. China, [hshuaisun@163.com](mailto:hshuaisun@163.com)

**R. Bai**

College of Mathematics and Information Science, Hebei University, Baoding 071002,  
P. R. China, [bairuipu@hbu.edu.cn](mailto:bairuipu@hbu.edu.cn)

**Y. Sheng**

Dept. of Mathematics, Jilin University, Changchun 130012, P. R. China  
[shengyh@jlu.edu.cn](mailto:shengyh@jlu.edu.cn)

**Manin Triples of 3-Lie Algebras Induced by Involutive Derivations**

Any involutive derivation  $D$  on a 3-Lie algebra  $A$  induces a local cocycle 3-Lie bialgebra  $(A \ltimes_{\text{ad}^*} A^*, \Delta)$ . We give precise formulas of the 3-Lie algebra  $((A \oplus A^*)^*, \Delta^*)$  and show that the local cocycle 3-Lie bialgebra  $(A \ltimes_{\text{ad}^*} A^*, \Delta)$  induced by the involutive derivation  $D$  gives rise to a Manin triple of 3-Lie algebras. We give examples of 12-dimensional and 16-dimensional Manin triples using involutive derivations on certain 3-dimensional and 4-dimensional 3-Lie algebras.

**Keywords:** 3-Lie algebra, involutive derivation, semi-direct product 3-Lie algebra, Manin triple, 3-Lie bialgebra.

**MSC:** 16T10, 16T25, 17A30, 17B62.