

# On speciality of binary-Lie algebras

Arenas, Manuel

Shestakov, Ivan

In the present work, binary-Lie, assocyclic, and binary  $(-1,1)$  algebras are studied. We prove that, for every assocyclic algebra  $A$ , the algebra  $A^-$  is binary-Lie. We find a simple non-Malcev binary-Lie superalgebra  $T$  that cannot be embedded in  $A^-$  for an assocyclic superalgebra  $A$ . We use the Grassmann envelope of  $T$  to prove the similar result for algebras. This solve negatively a problem by Filippov (see [1, Problem 2.108]). Finally, we prove that the superalgebra  $T$  is isomorphic to the commutator superalgebra  $A^-$  for a simple binary  $(-1,1)$  superalgebra  $A$ . © 2011 World Scientific Publishing Company.