MSC Classification: 17A30 17B60 17A75 17C40 17B67

Keywords: Cubic form with adjoin identity; Extended affine Lie algebra; Generalized quadrangle; Lie algebras of type BC_1; Lie Torus; Structurable algebras; Structurable torus

Review text:
The authors complete the classification of structurable tori with nontrivial involution, which was begun by B. N. Allison and Y. Yoshii [J. Pure Appl. Algebra 184 (2003), no. 2-3, 105-138]. Structurable tori are divided into the next classes: If the involution is trivial, a structurable torus is a Jordan torus, and was classified in [Coordinate algebras of extended affine Lie algebras of type A_1. J. Algebra 234 (2000), no. 1, 128-168]; structurable tori of type I are the tensor products of composition algebras over the algebra of Laurent polynomials; structurable tori of type II are constructed from a diagonal graded hermitian form over a class I associative torus with involution; and structurable tori of type III are divided into three subclasses: structurable tori of type III(a), constructed from diagonal hermitian form over the quaternion algebra with nonstandard involution over the algebra of Laurent polynomials, structurable tori of type III(b), constructed using the Cayley–Dickson doubling process from a Jordan torus of degree 4 over the algebra of Laurent polynomials, and structurable tori of type III(c), obtained using a construction of structurable algebras from a cubic form.
With this work the authors study the centerless core of extended affine Lie algebras of type BC_1, in the sense of E. Neher [Extended affine Lie algebras. C. R. Math. Acad. Sci. Soc. R. Can. 26 (2004), no. 3, 90-96], which was the last remaining case for the classification of extended affine Lie algebras over $\mathbb{C}$. Indeed, N. B. Allison, and Y. Gao classified all types but BC_r in [The root system and the core of an extended affine Lie algebra. Selecta Math. (N.S.) 7 (2001), no. 2, 149-212], J. R. Faulkner studied type BC_2 in [Lie tori of type BC_2 and structurable quasitori. Comm. Algebra 36 (2008), no. 7, 2593-2618], and B. N. Allison and G. Benkart dealt with BC_r, $r \geq 3$, in [Unitary Lie algebras and Lie tori of type BC_r, $r \geq 3$, Quantum affine algebras, extended affine Lie algebras, and their applications, 1-47, Contemp. Math., 506, Amer. Math. Soc., Providence, RI, 2010].

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