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Prime factors of quantum Schubert cell algebras and clusters for quantum Richardson varieties. (English) Zbl 1414.81128

Summary: The understanding of the topology of the spectra of quantum Schubert cell algebras hinges on the description of their prime factors by ideals invariant under the maximal torus of the ambient Kac-Moody group. We give an explicit description of these prime quotients by expressing their Cauchon generators in terms of sequences of normal elements in chains of subalgebras. Based on this, we construct large families of quantum clusters for all of these algebras and the quantum Richardson varieties associated to arbitrary symmetrizable Kac-Moody algebras and all pairs of Weyl group elements. Along the way we develop a quantum version of the Fomin-Zelevinsky twist map for all quantum Richardson varieties. Furthermore, we establish an explicit relationship between the Goodearl-Letzter and Cauchon approaches to the descriptions of the spectra of symmetric CGL extensions.

MSC:
81R10 Infinite-dimensional groups and algebras motivated by physics, including Virasoro, Kac-Moody, $W$-algebras and other current algebras and their representations
17B67 Kac-Moody (super)algebras; extended affine Lie algebras; toroidal Lie algebras
20G44 Kac-Moody groups
16D60 Simple and semisimple modules, primitive rings and ideals in associative algebras
14D21 Applications of vector bundles and moduli spaces in mathematical physics (twistor theory, instantons, quantum field theory)

Full Text: DOI

References:
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300 (2016), 672-716. · Zbl 1352.16037


[28] A. Mériaux and G. Cauchon, Admissible diagrams in \( \{ \mathfrak{U}_{\text{\textit{q}}} \} \)-\{w\}(\mathfrak{g}) \) and combinatoric properties of Weyl groups, Represent. Theory 14 (2010), 645-687. · Zbl 1233.17011


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