1-1-2008

Review: Degenerate Series Representations of the q-deformed Algebra soq'(r,s)

Gizem Karaali
Pomona College

Recommended Citation
Degenerate series representations of the $q$-deformed algebra $so'_q(r, s)$. (English summary)


This paper describes in detail certain representations of $so'_q(r, s)$, which is a real form of the complex $q$-deformed universal enveloping algebra $U'_q(so(n, C))$ [A. M. Gavrilik and A. U. Klimyk, Lett. Math. Phys. 21 (1991), no. 3, 215–220; MR1102131 (92k:17021)]. The latter algebra differs substantially in structure from the standard quantum algebra $U_q(so(n, C))$ as defined by Drinfel’d and Jimbo; for instance it is not a Hopf algebra. However, as it is defined in terms of the generators $I_{k,k-1} = E_{k,k-1} - E_{k-1,k}$ for $so(n, C)$, it has the nice property that

$$U'_q(so(n-2, C)) \subset U'_q(so(n-1, C)) \subset U'_q(so(n, C)),$$

which in turn allows one to work with Gel’fand-Tsetlin type bases for finite-dimensional representations of $U'_q(so(n, C))$, which have been studied in [N. Iorgov and A. U. Klimyk, Int. J. Math. Math. Sci. 2005, no. 2, 225–262; MR2143754 (2006c:17021)].

In the paper under review, the author focuses on certain infinite-dimensional representations of $so'_q(r, s)$. These representations are described in terms of the finite-dimensional representations of $so'_q(r)$ and $so'_q(s)$, the compact real forms of $U'_q(so(r, C))$ and $U'_q(so(s, C))$, respectively. Explicit action formulas are given. An irreducibility criterion for the general construction is provided, along with a description of the irreducible constituents of the reducible ones coming from the same construction.

Reviewed by Gizem Karaali

References

7. Noumi M., Macdonald’s symmetric polynomials as zonal spherical functions on quantum

Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

© Copyright American Mathematical Society 2008, 2013