Reseach Results

(1) The branching coefficients of the tensor product of finite-dimensional irreducible $U_q(\mathfrak{g})$-modules, where $\mathfrak{g}$ is $\mathfrak{so}(2n+1,\mathbb{C})$ (B_n-type), $\mathfrak{sp}(2n,\mathbb{C})$ (C_n-type), and $\mathfrak{so}(2n,\mathbb{C})$ (D_n-type), are expressed as the sum of products of three Littlewood-Richardson (LR) coefficients in the stable region. In [4] an interpretation of this formula on the branching rule in terms of Kashiwara crystals.

(2) In [1] the author proved that the set of primed tableaux admits the crystal structure for the queer Lie superalgebra $\mathfrak{q}(n)$ by giving the explicit odd Kashiwara operators. The forms of the highest and lowest weight vectors of primed tableaux were also given. By using these results, the author proved that the set of signed unimodal factorizations with m factors of reduced words of the type B-Coxeter groups admits the $\mathfrak{q}(m)$-crystal structure.

(3) The research subject also concerns $\mathfrak{q}(n)$-crystals, which are called queer supercrystals in [3]. It was shown that the set of increasing factorizations of fixed-point-free (FPF) involution words has the structure of queer supercrystals [3]. By exploiting the algorithm of symplectic shifted Hecke insertion recently introduced by Marberg [2], the author established the one-to-one correspondence between the set of increasing factorizations of FPF involution words and the set of primed tableaux.

(4) The research subject concerns the rigged configuration bijection. The result is not published yet. As stated in Research Plan, the author established the Kerov-Kirillov-Reshetikhin type bijection for the adjoint Kirillov-Reshetikhin crystal of the affine Lie algebra $G_2^{(1)}$.

References

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[5] T. Hiroshima, Queer supercrystal structure for increasing factorizations of fixed-point-free involution words、RIMS Kôkyûroku No. 2161 (2021) 143–155.