ID de Contribution: **38** Type: **Non spécifié**

Categorified Crystal Bases on Localized Quantum Coordinate Rings and Cellular Crystals

jeudi 16 novembre 2023 14:25 (45 minutes)

For a monoidal category $(\tau, \circ)$, if there exists a"real commuting family $(C_i, R_{Ci}, \phi_i)_{i\epsilon I}$", we can define a localization $\tilde{\tau}$ of τ by $(C_i, R_{Ci}, \phi_i)_{i\epsilon I}$. Let $R = R(\mathfrak{g})$ be the quiver Hecke algebra (=KLR algebra) associated with a simple Lie algebra $\mathfrak{g}$ and R-gmod the category of finite-dimensional graded R-modules, which is a monoidal category with a real commuting family $(C_i, R_{Ci}, \phi_i)_{i\epsilon I}$. Thus, we get its localization $\tilde{R}$-gmod. It has been shown that R-gmod categorifies the unipotent quantum coordinate ring $A_q(\mathfrak{g})$, that is, the Grothendieck ring $K(R$-gmod) is isomorphic to $A_q(\mathfrak{g})$. For the localized category $\tilde{R}$-gmod, its Grothendieck ring $K(\tilde{R} - gmod)$ defines the localized (unipotent) quantum coordinate ring $\widetilde{A_q(\mathfrak{g})}$.
We shall give a certain crystal structure on the set of self-dual simple objects $\mathbb{B}(\tilde{R} - gmod)$ in $\tilde{R}$-gmod-gmod. We also give the isomorphism of crystals from $\mathbb{B}(\tilde{R} - gmod)$ to the cellular crystal $\mathbb{B}_{\mathrm{i}} = B_{i_1} \otimes \cdots B_{i_N}$ for an arbitrary reduced word $\mathbf{i} = i_1 \cdots i_N$ of the longest Weyl group element. This result can be seen as a localized version for the categorification of the crystal base $B(\infty)$ for the subalgebra $U_q^-(\mathfrak{g})(\cong A_q(\mathfrak{g}))$ of the quantum algebra $U_q(\mathfrak{g})$, given by Lauda-Vazirani.

Orateur: Prof. NAKASHIMA, Toshiki (Sophia University Tokyo)