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*Inflations for representations of shifted quantum affine algebras*

Fix a finite-dimensional simple Lie algebra $\mathfrak{g}$ and let $\mathfrak{g}_J \subseteq \mathfrak{g}$ be a Lie subalgebra coming from a Dynkin diagram inclusion. Then, the corresponding restriction functor is not essentially surjective on finite-dimensional simple $\mathfrak{g}_J$-modules. In this talk, we will study Finkelberg-Tsymbaliuk's shifted quantum affine algebras $U_q^\mu(\mathfrak{g})$ and the associated categories $\mathcal{O}^\mu$ (defined by Hernandez). In particular, we will introduce natural subalgebras $U_q^\nu(\mathfrak{g}_J) \subseteq U_q^\mu(\mathfrak{g})$ and obtain a functor $\mathcal{R}_J$ from $\mathcal{O}^{sh} = \bigoplus_\mu \mathcal{O}^\mu$ to $\bigoplus_\nu (U_q^\nu(\mathfrak{g}_J)$-Mod) using the canonical restriction functors. We will then establish that $\mathcal{R}_J$ is essentially surjective on finite-dimensional simple objects by constructing notable preimages (called *inflations*) and will use these preimages to deduce certain $R$*-matrices* and examples of *cluster structures over Grothendieck rings*.