

# Equivariant multiplicities via representations of quantum affine algebras

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For any simply-laced type simple Lie algebra  $\mathfrak{g}$  and any orientation  $Q$  of the Dynkin diagram of  $\mathfrak{g}$ , we define an algebraic morphism  $\tilde{D}_Q$  on a torus  $\mathcal{Y}_Q$  containing the Grothendieck ring of Hernandez-Leclerc's category  $\mathcal{C}_Q$  of representations of the quantum affine algebra  $U_q(\hat{\mathfrak{g}})$ . We prove that the composition of  $\tilde{D}_Q$  with the truncated  $q$ -character morphism coincides with the morphism  $\bar{D}$  recently introduced by Baumann-Kamnitzer-Knutson in their study of equivariant multiplicities of Mirković-Vilonen cycles. This is achieved using the T-systems satisfied by the characters of Kirillov-Reshetikhin modules in  $\mathcal{C}_Q$ , as well as certain results by Brundan-Kleshchev-McNamara on the representation theory of quiver Hecke algebras. I will also explain how this alternative description of  $\bar{D}$  allows us to prove a conjecture from an earlier work of mine on the distinguished values of  $\bar{D}$  on the flag minors of the coordinate ring  $\mathbb{C}[\mathbf{N}]$  associated to  $\mathfrak{g}$ . In particular the previously observed polynomial identities relating the values of flag minors belonging to a same standard seed are now naturally interpreted from the recursive relations between the coefficients of the inverse quantum Cartan matrix of  $\mathfrak{g}$ . If time allows, I will conclude by illustrating our results from the perspective of Kang-Kashiwara-Kim-Oh's generalized Schur-Weyl duality.

This is a joint work with Jianrong LI.