

Quantum Bruhat Graphs and Tilted Richardson Varieties

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Abstract

The quantum Bruhat graph, initially introduced by Brenti, Fomin, and Postnikov, is a weighted directed graph defined on finite Weyl groups. It serves as a valuable tool for exploring the quantum cohomology ring of the flag variety. In this presentation, we present a combinatorial formula for the minimal weights between any pair of permutations within the quantum Bruhat graph. Furthermore, for an ordered pair of permutations u and v , we introduce the tilted Richardson variety $T_{u,v}$, demonstrating its equivalence to the two-pointed curve neighborhood of opposite Schubert varieties X_u and X^v in the minimal degree d . We establish a Deodhar-like decomposition for tilted Richardson varieties, leveraging it to prove several results. This is joint work with Shiliang Gao and Yibo Gao.