Monodromy and K-theory of Schubert curves via generalized jeu de taquin

Maria Monks Gillespie*[1] and Jake Levinson*[2]

[1]University of California [Berkeley] – Berkeley, CA, United States
[2]University of Michigan [Ann Arbor] – 500 Church Street Ann Arbor, MI 48109-1090, United States

Abstract

We establish a combinatorial connection between the real geometry and the K-theory of complex Schubert curves Spλq, which are one-dimensional Schubert problems defined with respect to flags osculating the rational normal curve. In a previous paper, the second author showed that the real geometry of these curves is described by the orbits of a map ω on skew tableaux, defined as the commutator of jeu de taquin rectification and promotion. In particular, the real locus of the Schubert curve is naturally a covering space of RP1, with ω as the monodromy operator.

We provide a fast, local algorithm for computing ω without rectifying the skew tableau, and show that certain steps in our algorithm are in bijective correspondence with Pechenik and Yong's genomic tableaux, which enumerate the K-theoretic Littlewood-Richardson coefficient associated to the Schubert curve. Using this bijection, we give purely combinatorial proofs of several numerical results involving the K-theory and real geometry of Spλq.

*Speaker