Affine type A geometric crystal structure on the Grassmannian

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Abstract

We construct a type A(1) n–1 affine geometric crystal structure on the Grassmannian Gr(k, n). The tropicalization of this structure recovers the combinatorics of crystal operators on semistandard Young tableaux of rectangular shape (with n – k rows), including the affine crystal operator e 0. In particular, the promotion operation on these tableaux essentially corresponds to cyclically shifting the Plu cker coordinates of the Grassmannian.

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