



The Hong Kong University of Science and Technology

Department of Mathematics

MPhil THESIS EXAMINATION

Demazure crystals for flagged key polynomials

By

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ABSTRACT

One definition of key polynomials is as the weight generating functions of key tableaux. Assaf and Schilling introduced a crystal structure on key tableaux and related it to the Morse-Schilling crystal on reduced factorizations for permutations via the weak Edelman-Greene insertion. In this thesis, we consider generalizations of key tableaux and reduced factorizations depending on a flag. We extend the weak EG insertion to a bijection between our flagged objects and show that the recording tableau gives a crystal isomorphism. We prove that extending the Assaf-Schilling crystal operators to flagged key tableaux gives a Demazure crystal. As an application, we show that the weight generating functions of flagged key tableaux recover Reiner and Shimozono's definition of flagged key polynomials.

Date : 9 May 2024, Thursday

Time : 10:00 a.m.

Venue : Room 5510 (Lifts 25/26)

Thesis Examination Committee

Chairman : Prof. Quoc HO, MATH /HKUST

Thesis Supervisor : Prof. Eric Paul MARBERG, MATH/HKUST

Member : Prof. Ivan Chi Ho IP, MATH/HKUST

(Open to all faculty and students)

The student's thesis is now being displayed on the reception counter in the General Administration Office (Room 3461).