
The Delta Conjecture

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Abstract

We conjecture two combinatorial interpretations for the symmetric function e_{ken} , where f is an eigenoperator for the modified Macdonald polynomials defined by Bergeron, Garsia, Haiman, and Tesler. Both interpretations can be seen as generalizations of the Shuffle Conjecture, a statement originally conjectured by Haglund, Haiman, Remmel, Loehr, and Ulyanov and recently proved by Carlsson and Mellit. We show how previous work of the second and third authors on Tesler matrices and ordered set partitions can be used to verify several cases of our conjectures. Furthermore, we use a reciprocity identity and LLT polynomials to prove another case. Finally, we show how our conjectures inspire 4-variable generalizations of the Catalan numbers, extending work of Garsia, Haiman, and the first author.

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