

1048-05-38

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Longest strictly increasing subsequences and the Hecke insertion algorithm.

We define and study the Plancherel-Hecke probability measure on Young diagrams; the Hecke algorithm of [Buch-Kresch-Shimozono-Tamvakis-Yong '06] is interpreted as a polynomial-time exact sampling algorithm for this measure. Using the results of [Thomas-Yong '07] on jeu de taquin for increasing tableaux, a symmetry property of the Hecke algorithm is proved, in terms of longest strictly increasing/decreasing subsequences of words. This parallels classical theorems of [Schensted '61] and of [Knuth '70], respectively, on the Schensted and Robinson-Schensted-Knuth algorithms. We investigate, and conjecture about, the limit typical shape of the measure, in analogy with work of [Vershik-Kerov '77], [Logan-Shepp '77] and others on the “longest increasing subsequence problem” for permutations. We also include a related extension of [Aldous-Diaconis '99] on patience sorting. (Received January 05, 2009)