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On some polynomials enumerating Fully Packed Loops configurations, evaluation at negative values

Tiago Fonseca

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In this article, we are interested in the enumeration of Fully Packed Loops configurations on a grid with a given noncrossing matching. These quantities also appear as the groundstate components of the Completely Packed Loops model as conjectured by Razumov and Stroganov and recently proved by Cantini and Sportiello. When considering matchings with p nested arches these quantities are known to be polynomials. In a recent article, Fonseca and Nadeau conjectured some unexpected properties of these polynomials, suggesting that these quantities could be combinatorially interpreted even for negative p . Here, we prove some of these conjectures. Notably, we prove that for negative p we can factor the polynomials into two parts a "positive" one and a "negative" one. Also, a sum rules of the negative part is proven.

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