

Kongres

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For a poset P on $[n]$ we associate the poset cone

$$C_P := \text{cone}\{e_i - e_j : i <_P j\},$$

where e_1, e_2, \dots, e_n are the standard basis vectors in \mathbb{R}^n . The normal fan $\mathcal{N}(C_P)$ of this polyhedron is a coarsening of a subfan of the braid arrangement fan, given by hyperplanes $\{x_i = x_j\}_{1 \leq i < j \leq n}$. Weighted P -partitions enumerator F_q for a poset cone C_P is defined as

$$F_q(C_P) := \sum_{\omega \in \mathbb{Z}_+^n \cap \mathcal{N}(C_P)} q^{n-1-\dim(G_\omega)} x_{\omega_1} x_{\omega_2} \cdots x_{\omega_n},$$

where G_ω is the unique face of C_P which is determined by the condition that $\omega \in \mathbb{Z}_+^n$ lies in the relative interior of its normal cone. The function $F_q(C_P)$ has an algebraic meaning as the universal morphism from a certain combinatorial Hopf algebra of posets \mathcal{P} to the Hopf algebra \mathcal{QSym} of quasisymmetric functions. For a well labelled poset P and $q = 0$ enumerator F_q specializes to the classical Gessel's P -partitions enumerator. We also provide an example of posets with the same P -partitions enumerators but which are distinguished by corresponding weighted quasisymmetric enumerators.

References

- [1] M. Aguiar, F. Ardila, *Hopf monoids and generalized permutahedra*, arXiv:1709.07504
- [2] M. Pešović, T. Stojadinović, *Weighted P -partitions enumerator*, *Applicable Analysis and Discrete Mathematics* (2021) 337–356