

# Arrangements of equal minors in the positive Grassmannian

Miriam Farber\*

[mfarber@mit.edu](mailto:mfarber@mit.edu)

---

We discuss arrangements of equal minors of totally positive matrices. More precisely, we investigate the structure of equalities and inequalities between the minors. We show that arrangements of equal minors of largest value are in bijection with sorted sets, which earlier appeared in the context of alcoved polytopes and Gröbner bases. Maximal arrangements of this form correspond to simplices of the alcoved triangulation of the hypersimplex; and the number of such arrangements equals the Eulerian number. On the other hand, we prove in many cases that arrangements of equal minors of smallest value are exactly weakly separated sets. Weakly separated sets, originally introduced by Leclerc and Zelevinsky, are closely related to the positive Grassmannian and the associated cluster algebra. However, we also construct examples of arrangements of smallest minors which are not weakly separated using chain reactions of mutations of plabic graphs.

*This is a joint work with Alexander Postnikov.*

---

\*Department of Mathematics, MIT, 540 Memorial Drive, Cambridge, MA 02139, USA.