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The combinatorics of totally positive minors and implications

A matrix is called totally positive if all of its minors are positive. Recently, such minors have been expressed in terms of parameters associated with a corresponding bidiagonal factorization, and consequently, these minors can be written as subtraction free-expressions in these parameters. This new representation has been recast in a number of different settings, and it continues to arise as a useful tool involving totally positive matrices.

In this talk, I will review this combinatorial representation and discuss some of the interesting resulting applications, including determinantal inequalities and an implication to Jordan canonical forms.