Completion Problem for Totally Positive Matrices

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An $m \times n$ matrix is called TP_k if every minor of size at most k is positive. The TP_k-completion problem investigates which partial matrices can be completed to form a TP_k matrix. Using the generalized Bruhat order on permutations and the logarithmic method, an explicit, finite list of polynomial inequalities in the specified entries is given for TP_2-completion. For $k > 2$, the TP_k-completion problem has been studied, and several results are known; however, it remains open for $k > 2$. This talk will review some past and recent results related to the TP_k-completion problem for $k \geq 2$.