## Computing Random Matchings in Permutohedra

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The permutohedron of order $n$ is the convex hull of all permutations of the vector $\left(x_{1}, x_{2}, \ldots, x_{n}\right)$ in $R^{n}$. It is an $(n-1)$-dimensional polytope. The vertices and edges of the permutohedron of order $n$ is isomorphic to the Cayley graph of the symmetric group generated by the transpositions of two consecutive elements, i. e. $G_{n}=\operatorname{Cay}\left(S_{n}, T_{n}\right)$ where $S_{n}$ is the symmetric group and $T_{n}=\{(i, i+1) \mid 1 \leq i \leq n-1\}$ is the set of adjacent transpositions. The problem of computing random matchings in permutohedra is intractable due to the size of graph $G_{n}$. We show that random matchings in permutohedra can be computed for small $n$.

