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## Hidden symmetries and Large N factorisation for permutation invariant matrix observables

Matrix models with continuous symmetry are well-studied objects with rich connections to statistics, combinatorics, representation theory and geometry. A natural extension is to consider matrix models with discrete symmetry. Recently, a 13-parameter family of Gaussian 1-matrix models with permutation symmetry was constructed, and the enumeration of permutation invariant observables was connected to the enumeration of directed graphs. We give a correspondence between permutation invariant observables and equivalence classes of elements in the diagrammatic partition algebra. Using the correspondence, we prove large N factorisation of the two-point function of permutation invariant observables, at a special point in parameter space where the symmetry is enhanced to  $O(N)$ .

### Type of contribution

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