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*Hall-Littlewood process.*

We introduce a 1-parameter family of measures on plane partitions that is a generalization of the uniform measure on plane partitions. We compute its weighted correlation functions. This measure is a special case of the Hall-Littlewood process that is defined using Hall-Littlewood symmetric functions.

The Hall-Littlewood process generalizes the Schur process introduced by Okounkov and Reshetikhin as well as the shifted Schur process. We use the Fock space formalism to prove that the shifted Schur process is a Pfaffian point process and calculate its correlation kernel. A special case of this process is a measure on diagonally strict plane partitions or alternatively on nonintersecting paths. We compute the bulk scaling limit when partitions become large.

We obtain a generalization of MacMahon's generating formula of plane partitions. This formula is obtained from the computation of the partition function for the Hall-Littlewood process. (Received August 12, 2008)