

# TABLEAUX AND EXCLUSION PROCESSES

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ABSTRACT. Several variations of Young tableaux have recently been introduced due to connections with the asymmetric simple exclusion process (ASEP), an important particle model which has been studied extensively. In particular, tableaux provide a combinatorial formula for the steady state distribution of the ASEP. An interesting objective is to describe various statistics on the ASEP via tableaux and this is the focus of my research. My thesis has confirmed conjectures on both tree-like tableaux and staircase tableaux which are relevant to the ASEP. In particular, I have confirmed a conjecture by Laborde Zubieta on the enumeration of corners in tree-like tableaux. Corners are of interest since corners in tree-like tableaux correspond to a statistic of the ASEP known as the current *activity*. In addition, I have partially confirmed a conjecture of Hitczenko and Janson about the distribution of the number of symbols along the diagonals of staircase tableaux. Diagonals are of interest since the first diagonal entries of a staircase tableaux dictate the state of the ASEP it is associated with. This talk will be a discussion of these results and the future direction of this research objective.