BOUNDARY CORRELATION FUNCTIONS FOR THE SIX-VERTEX MODEL

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We consider the six vertex model on an $N \times N$ grid, with domain wall boundary conditions at the combinatorial point, namely where the crossing parameter equals $2\pi/3$. The probability distribution of the position of the single c-type vertex in the first row is the content of the Refined Alternating Sign Matrix theorem, first proved by Zeilberger. Stroganov later considered the joint distribution of the c-type vertex in the first row and first column, as well as the first and last row. In joint work with Dan Romik, we extend these results to higher boundary correlation functions. We prove explicit formulas for the three-point and the full four-point boundary correlation function. The main tool is the proof of a new representation of the partition function of the model as a determinant whose size depends only on the number of inhomogeneous parameters, not on the size, N. This computationally efficient method is of independent interest.