1135-05-2950 **Diljit Singh***, diljit.singh@macaulay.cuny.edu. *Combinatorial Models of Quantum Matrices.*

Quantum matrices are matrices with entries that almost commute, e.g., they commute up to a constant. These structures arise naturally when studying Hopf algebras, representation theory, and knot invariants. Much recent progress in the theory of quantum determinants has been done using combinatorial and algebraic methods revolved around path systems over Cauchon Diagrams. We introduce and bound two growth functions: one counting the expected number of legal path systems in a diagram with m squares colored black, $B_n(x)$; the other counting the expected number of path systems if our our matrix (with a fixed coloring) increases in dimension, $D_b(x)$.

Using these diagrams, we also provide a simple and new proof for a case of the quantum analog of Sylvester's Determinant Identity. In addition to this we give a recursive method to grow our proof to cover infinitely more cases of the identity. (Received September 26, 2017)