1116-11-451 **Eric Rowland*** (rowland@lacim.ca) and **Reem Yassawi**. *Congruences for diagonals of rational power series.*

In the last decade a number of results have appeared concerning congruence properties of integer sequences that arise in combinatorics, such as the Catalan and Motzkin numbers. The proofs have mostly relied on methods particular to each sequence. However, by realizing a sequence as the diagonal of a rational power series in multiple variables, we show that one can compute congruence information modulo prime powers in terms of finite automata. This method gives completely automatic proofs of known results, establishes a number of new theorems for well-known sequences, and allows us to resolve some conjectures regarding the Apéry numbers. (Received September 02, 2015)