## Vector Parking Functions with Periodic Boundaries and Rational Parking Functions

## Catherine Yan

(Texas A&M University)

## Abstract

Vector parking functions are sequences of non-negative integers whose order statistics are bounded by a given integer sequence  $\mathbf{u} = (u_0, u_1, u_2, ...)$ . Using the theory of fractional power series and an analog of Newton-Puiseux Theorem, we derive the exponential generating function for the number of  $\mathbf{u}$ parking functions when  $\mathbf{u}$  is periodic. Our method is to convert an Appell relation of Gončarov polynomials to a system of linear equations. Solving the system we obtain an explicit formula of the exponential generating function in terms of Schur functions of certain fractional power series. In particular, we apply our methods to rational parking functions for which the boundary is induced by a linear function with rational slope.