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**Adriano M. Garsia\*** ([garsia@math.ucsd.edu](mailto:garsia@math.ucsd.edu)), 4695 Mt Armet Dr, San Diego, CA 92117. *A new "dinv" statistic in the Theory of Parking Functions and Diagonal Harmonics.*

The decade old "shuffle conjecture" gives a Parking function interpretation to the Frobenius characteristic of Diagonal Harmonic polynomials. A recent more refined version by Haglund-Morse-Zabrocki states that the Hall scalar product of the homogeneous basis element  $h_\mu$  with the Nabla operator acting upon a modified Hall-Littlewood polynomial indexed by a composition  $p$  enumerates, by  $t^{\text{area}}q^{\text{dinv}}$ , the family of Parking Functions whose supporting Dyck path hits the main diagonal according to  $p$  and whose diagonal word is a shuffle of type  $\mu$ . Computer explorations show that when  $\mu = (j, n)$ , by replacing Nabla with the Macdonald eigen-operator  $\Delta_{h_j}$  the composition  $p$  gives the position of the diagonal hits of the Dyck path supporting cars  $j + 1, j + 2, \dots, j + n$ . The authors prove a recursion satisfied by the resulting polynomial and use it to construct a dinv-like statistic "ndinv" proving that this polynomial enumerates the latter family of Parking Functions by  $t^{\text{area}}q^{\text{ndinv}}$ . This is joint work of the presenter with A. Duane and M. Zabrocki. (Received July 08, 2011)