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Parking Function Properties Suggested by the Haglund-Morse-Zabrocki Conjecture

The "diagonal composition" of a parking function gives the distance in its main diagonal between successive hits of its Dyck path. Recently Jim Haglund, Jennifer Morse, and Mike Zabrocki gave a sharpening of the "shuffle conjecture" namely that for any composition c , applying ∇ to a certain Hall-Littlewood polynomial indexed by c gives a weighted sum of the parking functions of diagonal composition c . We examine parking function properties implied by their conjecture.