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**Ira M. Gessel\*** ([gessel@brandeis.edu](mailto:gessel@brandeis.edu)), Department of Mathematics, MS 050, Brandeis University, Waltham, MA 02476, and **Yan Zhuang**. *Shuffle-compatible permutation statistics*. Preliminary report.

We call a permutation statistic *st* *shuffle-compatible* if for any two disjoint permutations  $\pi$  and  $\sigma$ , the distribution of *st* on the shuffles of  $\pi$  and  $\sigma$  depends only on  $\text{st}(\pi)$ ,  $\text{st}(\sigma)$ , and the lengths of  $\pi$  and  $\sigma$ . For example, it follows from Richard Stanley's theory of P-partitions that the descent set, the descent number  $\text{des}$ , the major index  $\text{maj}$ , and the ordered pair  $(\text{des}, \text{maj})$  are shuffle compatible, and it follows from John Stembridge's theory of enriched P-partitions that the peak set and the number of peaks are shuffle-compatible.

To any shuffle-compatible permutation statistic one can associate an algebra whose multiplication describes the distribution of the statistic on shuffles.

We will discuss an approach to shuffle-compatible permutation statistics using noncommutative symmetric functions, and describe some of the associated algebras. (Received July 18, 2016)