1096-05-280 **Kassie Archer*** (kassie.r.archer.gr@dartmouth.edu) and **Sergi Elizalde**. *Cyclic permutations realized by the signed shift.*

Suppose $W_k$ is the set of infinite words on $k$-letters and $\Sigma_k$ is the $k$-shift on $W_k$ defined by

$$\Sigma_k(a_1a_2a_3\ldots) = a_2a_3a_4\ldots.$$

By equipping $W_k$ with the lexicographic ordering, we can define the *patterns* associated to $\Sigma_k$ to be permutations in the same relative order as orbits of words with respect to $\Sigma_k$. Restricting to the set of periodic words, the patters we get are called *periodic patterns*. We find a bijection between the periodic patterns and cyclic permutations with exactly $k-1$ descents and we enumerate these permutations, recovering results of Gessel and Reutenauer.

We generalize this result by looking at signed shifts, a family of maps on $W_k$. The $k$-shift is a special case of a signed shift. We find that the periodic patterns associated with a given signed shift are in bijection with the cyclic permutations in a given permutation class which can be described in terms of pattern avoidance.

Using this bijection, we find interesting combinatorial results, including the enumeration of the set of cyclic permutations in certain permutation classes and a bijection between unimodal cyclic permutations and primitive binary necklaces with an odd number of ones. (Received August 26, 2013)