

1056-05-1512

Ira M. Gessel* (gessel@brandeis.edu), Department of Mathematics, MS 050, Brandeis University, Waltham, MA 02453-2728. *Flag descents and P-partitions.*

A *signed permutation* of $[n] = \{1, 2, \dots, n\}$ is a sequence $a_1 a_2 \cdots a_n$ of integers such that $|a_1| |a_2| \cdots |a_n|$ is a permutation of $[n]$. Let B_n denote the set of signed permutations of $[n]$. In 2001, Adin, Brenti, and Roichman introduced the *flag-descent* statistic on signed permutations: for $\pi \in B_n$ we define $\text{fdes}(\pi)$ to be $2 \text{des}(\pi) + \epsilon(\pi)$, where $\text{des}(a_1 a_2 \cdots a_n)$ is the number of $i \in [n - 1]$ for which $a_i > a_{i+1}$, and $\epsilon(a_1 a_2 \cdots a_n)$ is 1 if $a_1 < 0$ and 0 if $a_1 > 0$. Adin, Brenti, and Roichman proved that

$$\sum_{k=0}^{\infty} (k+1)^n t^k = \frac{\sum_{\pi \in B_n} t^{\text{fdes}(\pi)}}{(1-t)(1-t^2)^n}.$$

I will explain how Richard Stanley's theory of P-partitions can be used to prove this and related formulas. (Received September 22, 2009)