

1068-05-220

**Nan Li\*** (nan@math.mit.edu), MA. *h-polynomial of half open hypersimplices.*

The  $(k, n)$ -th hypersimplex  $\Delta_{k,n}$  is defined as the slice of the hypercube  $[0, 1]^{n-1}$  located between the two hyperplanes  $\sum x_i = k - 1$  and  $\sum x_i = k$ . It is well-known that the normalized volume of  $\Delta_{k,n}$  is the Eulerian number  $A_{k,n-1}$ , i.e., the number of permutations in  $n - 1$  letters and  $k - 1$  excedances. In this paper, we study the  $h$ -polynomial of the half open hypersimplex  $\Delta'_{k,n}$ , defined as  $\Delta_{k,n}$  if  $k = 1$ , and  $\Delta_{k,n}$  with the face  $\sum x_i = k - 1$  removed if  $k > 1$ . It is clear that the sum of all the coefficients in the  $h$ -polynomial of  $\Delta'_{k,n}$  is  $A_{k,n-1}$ . The main result of this paper says that the coefficient of  $x^s$  in the  $h$ -polynomial is the number of permutations in  $n - 1$  letters,  $k - 1$  excedances and  $s$  descents. (Received January 18, 2011)