

1123-05-296

James Haglund, Brendon Rhoades and **Mark Shimozono*** (mshimo@math.vt.edu),
Department of Mathematics, MC 0123, 460 McBryde Hall, Virginia Tech, 225 Stanger St.,
Blacksburg, VA 24061. *Ordered set partitions, generalized coinvariant algebras, and the Delta
Conjecture.*

The coinvariant algebra R_n is the quotient of the polynomial ring P in n variables by the ideal I_n generated by symmetric polynomials with vanishing constant term. This algebra arises as the cohomology ring of the flag variety and as the coordinate ring of the schematic intersection of the nullcone of nilpotent $n \times n$ matrices, with the diagonal matrices. We introduce a generalization $I_{n,k}$ of the ideal I_n indexed by two positive integers $k \leq n$. The quotient $R_{n,k} = P/I_{n,k}$ is a graded S_n -module and specializes to R_n when $k = n$. Many nice properties of R_n generalize to $R_{n,k}$. We describe the Hilbert series of $R_{n,k}$, give extensions of the Artin and Garsia-Stanton monomial bases of R_n to $R_{n,k}$, determine the Gröbner basis for $I_{n,k}$, and describe the graded Frobenius series of $R_{n,k}$. The bases of $R_{n,k}$ are indexed by ordered partitions of a set of n elements with k blocks. The Delta Conjecture of Haglund, Remmel, and Wilson is a generalization of the Shuffle Conjecture in the theory of diagonal coinvariants. We show that the graded Frobenius series of $R_{n,k}$ is (up to a minor twist) the $t = 0$ specialization of the combinatorial side of the Delta Conjecture. (Received August 29, 2016)