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Gamma positivity of the Excedance based Eulerian polynomial in positive elements of Classical Weyl Groups

The classical Eulerian polynomials $A_n(t)$ are known to be gamma positive. Define the positive Eulerian polynomial $AExc_n^+(t)$ as the polynomial obtained when we sum excedances over the alternating group. We show that $AExc_n^+(t)$ is gamma positive iff $n \geq 5$ and $n \equiv 1 \pmod{2}$. When $n \geq 4$, and $n \equiv 0 \pmod{2}$ we show that $AExc_n^+(t)$ can be written as a sum of two gamma positive polynomials. Similar results are shown when we consider the positive type-B and type-D Eulerian polynomials. Finally, we show gamma positivity results when we sum excedances over derangements with positive and negative sign. Our main results is that the polynomial obtained by summing excedance over a conjugacy class indexed by λ is gamma positive.

This talk is based on joint work with Krishnan Sivasubramanian.