1078-05-347   **Hwanchul Yoo*** (`hcyoo@kias.re.kr`), 1530 KIAS 85 Hoegi-ro Dongdaemun-gu, Seoul, 130-722, South Korea. *Specht modules and polytopes.* Preliminary report.

Liu studied Specht modules of forests. He proved that the dimension of the Specht module is the same as the normalized volume of the matching polytope of the forest. To generalize this result, we define a matching ensemble polytope for each pair of a bipartite graph and a certain collection of matchings of the graph. We conjecture that the normalized volume of the polytope equals the dimension of the corresponding Specht module in many cases. We will give evidences that support this conjecture.

In particular, we show that the volume of the polytope for a length $2k$ cycle graph is $k(E_{2k-1} - C_{k-1})$. Here E_{2k-1} is the Euler number that is the number of alternating permutations of length $2k-1$ and C_{k-1} is the $(k-1)$-th Catalan number. We also show how Postnikov's conjecture on toric Specht module implies that the dimension of the Specht module in this case coincides with $k(E_{2k-1} - C_{k-1})$. This is done by describing the Frobenius character of the module in terms of certain toric tableaux. We conjecture that this description applies for more general diagrams of toric shape. (Received December 13, 2011)