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Helene Barcelo, Megan Bernstein, Sarah Bockting-Conrad, Erin McNicholas, Kathryn Nyman and Shira Viel*, Department of Mathematics, Box 8205, Raleigh, NC 27695. *Algebraic Voting Theory and Representations of $S_m \wr S_n$* . Preliminary report.

We present ongoing work on an algebraic voting theory approach to the election of committees. In particular, consider the problem of selecting an n -member committee by choosing one of m candidates from each of n distinct departments. There is a natural action of the wreath product of S_m with S_n on the set of such committees, first permuting candidates within departments and then departments themselves. This action extends to the profile and results spaces, which we may then view as $\mathbb{Q}S_m \wr S_n$ -modules, and positional voting procedures such as the Borda count may be analyzed as $\mathbb{Q}S_m \wr S_n$ -module homomorphisms.

We decompose the profile and results spaces into simple submodules and apply Schur's Lemma to deduce what voting information is lost in the election process and what information impacts the outcome. Further, we extend a result of Saari with an algebraic proof, showing that so long as weighting vectors are different enough, the associated positional voting procedures can yield arbitrarily different outcomes. (Received August 15, 2017)