1125-13-1545 **Nic Ford**, **Jake Levinson*** (jakelev@umich.edu) and **Steven Sam**. *Foundations of Boij-Söderberg Theory for Grassmannians.*

Boij-Söderberg theory characterizes the syzygies of graded modules (up to scalar) and relates them to sheaf cohomology on projective space. We extend the theory to the setting of GL_k-equivariant modules and sheaf cohomology on Grassmannians. Algebraically, we study modules over a polynomial ring in kn variables ($k \leq n$), thought of as the entries of a $k \times n$ matrix.

We give equivariant analogues of three important features of the ordinary theory: the Herzog-Kühl equations (linear constraints on Betti tables); the nonnegative bilinear pairing between Betti tables and cohomology tables; and the explicit polyhedral structure of the cone of Betti tables for square matrices. The latter cone is the target of the bilinear pairing; it serves as a base case for the theory.

Our statements specialize to those of Boij-Söderberg theory for graded modules when $k = 1$. Our proof of the equivariant pairing gives a new proof in the graded setting: it relies on finding perfect matchings on certain graphs associated to Betti tables. (Received September 17, 2016)