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Connor Thomas Ahlbach* (ahlbach@uw.edu), 1901 NE 85th St., Apt. 311, Seattle, WA 98115,
and **Joshua P Swanson**. *Cyclic Sieving, Necklaces, Branching Rules, and Thrall's problem*.

The cyclic sieving phenomenon relates a statistic generating function on a finite set to a cyclic action on the same set. On the other hand, the higher Lie modules, first constructed by Thrall, have been heavily studied, but a combinatorial description of their decomposition into irreducibles is still open. We show that the cyclic sieving phenomenon of Reiner–Stanton–White together with necklace generating functions arising from work of Klyachko offer a remarkably unified, direct, and largely bijective approach to a series of results due to Kraśkiewicz–Weyman, Stembridge, and Schocker related to the so-called higher Lie modules and branching rules for inclusions the wreath product of cyclic and symmetric group into a symmetric group. This provides a relatively rare instance of cyclic sieving being used to derive results in representation theory rather than the other way around. Extending the approach gives monomial expansions for certain graded Frobenius series arising from a generalization of Thrall's problem. (Received September 17, 2018)