

# Non-linear Sylow Branching Coefficients for $\mathfrak{S}_n$

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The study of the relationship between the representation theory of a finite group and its Sylow  $p$ -subgroups has been at the center of some interest recently. In this talk I will introduce some results about the restriction of irreducible characters to the Sylow, and then focus the attention on the symmetric groups. In the first part, I will briefly mention some of the combinatorial theory needed for the study of the irreducible characters of  $\mathfrak{S}_n$ . I refer to [J78] for the details. Then I will present some results concerning non-linear constituents of the restriction of irreducible characters to the Sylow  $p$ -subgroup  $P_n$ , generalizing what has been done in [GN]. In particular I will give the description of the set of irreducible characters that have at least a constituent of a given fixed degree in their restriction to  $P_n$ . This is a recent joint work with Eugenio Giannelli.

## References

- [GN] E. GIANNELLI AND G. NAVARRO, Restricting irreducible characters to Sylow  $p$ -subgroups, *Proc. Amer. Math. Soc.* **146** (2018), no. 5, 1963–1976.
- [J78] G. JAMES, *The representation theory of the symmetric groups*, Lecture Notes in Mathematics, vol. 682, Springer, Berlin, 1978.

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