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*Interactions between knot theory and representations of the symmetric group.*

Springer varieties are a special collection of flag varieties whose homology carries an action of the symmetric group with the top-dimensional homology an irreducible representation. For a fixed integer  $n$ , there is a Springer variety for each partition of  $n$ . In the case of two-element partitions, Springer varieties have important connections to Khovanov's theory of categorified tangle invariants. In past work, we use this to explicitly construct the Springer representation for two-element partitions of  $n$ . This construction operates skein-theoretically on crossingless matchings.

This simple, knot-theoretic approach can be used once again to construct the Springer representation in the case of three-element partitions of  $n$ . In this setting embedded, trivalent, directed graphs called  $sl(3)$  webs replace crossingless matchings, and the skein relation is more interesting. We will show how certain combinatorial data about symmetric group representations are naturally and intuitively encoded in this knot-theoretic framework. (Received August 16, 2011)