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Arvind Ayyer, Steven Klee and Anne Schilling* (anne@math.ucdavis.edu), Department of Mathematics, One Shields Ave, University of California, Davis, CA 95616. *Combinatorial Markov chains on linear extensions.*

We consider generalizations of Schützenberger’s promotion operator on the set L of linear extensions of a finite poset of size n . This gives rise to a strongly connected graph on L . By assigning weights to the edges of the graph in two different ways, we study two Markov chains, both of which are irreducible. The stationary state of one gives rise to the uniform distribution, whereas the weights of the stationary state of the other has a nice product formula. This generalizes results by Hendricks on the Tsetlin library, which corresponds to the case when the poset is the anti-chain and hence $L = S_n$ is the full symmetric group. We also provide explicit eigenvalues of the transition matrix in general when the poset is a rooted forest. This is shown by proving that the associated monoid is R -trivial and then using Steinberg’s extension of Brown’s theory for Markov chains on left regular bands to R -trivial monoids. This is joint work with Arvind Ayyer and Steve Klee.

Time permitting we will also mention new models (sandpile and TOOM models), where the techniques of R -trivial monoids seem to work. This is based on joint work with Arvind Ayyer and Nicolas M. Thiéry. (Received August 26, 2012)