1108-05-579 **Franco Saliola*** (saliola.franco@uqam.ca) and **A. B. Dieker**. *Spectrum of random-to-random operators.*

Pick a card–any card!–from the deck, and remove it; then put it back anywhere in the deck. Repeating this process leads to a method of shuffling a deck of cards known as the random-to-random shuffle. Its efficiency is controlled by the spectrum of its transition matrix, which turns out to be closely related to the combinatorics of the symmetric group.

We give a combinatorial description of the spectrum and outline some of the ideas that go into the proof. This settles a conjecture made in 2002 by Uyemura-Reyes: after a suitable renormalization, the spectrum is integral. Our analysis makes considerable use of the representation theory of the symmetric group. (Received January 20, 2015)