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Roberto Imbuzeiro Oliveira* (rimfo@impa.br), Estrada Dona Castorina, 110, Rio de Janeiro, RJ 22460-320, Brazil. *The interchange process has the same spectral gap as the underlying random walk.* Preliminary report.

Given a graph G with vertex set $[n]$, an interchange process on G is a continuous-time walk on permutations of $[n]$ by random transpositions, where: (i) only transposition between adjacent vertices of G are allowed; (ii) each such transposition occurs at rate 1.

In this talk we prove a longstanding conjecture of Aldous: the transition matrix of the interchange process on G has the same spectral gap as combinatorial Laplacian of G . This was previously known for trees and (asymptotically) for hypercubes. Moreover, while the previous proofs were essentially analytic in nature, our approach relies on probabilistic ideas, most notably the usual coupling-based characterization of the spectral gap of a finite Markov chain. (Received February 15, 2008)