

Proposition de stage de Master 2
ANALYSE MATHÉMATIQUE ET APPLICATIONS
Orléans-Tours

Cédric Lecouvey et Emmanuel Lesigne (Professeurs à l'Université de Tours)

**RANDOM WALK IN A CONE AND TABLEAUX
COMBINATORICS.**

The subject that we propose is on a bridge between probability theory and combinatorics associated to group representation theory. It can be tackled by a student having a basic knowledge in probability.

From the probabilistic point of view the object under study is a random walk in \mathbb{N}^k conditioned to stay in a cone. This Markov chain is described as the image of the original random walk by a combinatorial transformation. This transformation is related to an algorithm used in the theory of Young tableaux.

The student will have to study, understand and set out a part of article [1].

No knowledge in advanced Algebra is needed. In probability theory, the prerequisites are a basic course including the simplest examples of stochastic processes (see for example the last chapters of the book [2]) and an introduction to Markov chains.

- [1] N. O'Connell, *A path-transformation for random walks and the Robinson-Schensted correspondence*. Trans. Amer. Math. Soc. 355 (2003), no. 9, 3669–3697.
<http://www.ams.org/tran/2003-355-09/S0002-9947-03-03226-4/home.html>
- [2] G. Grimmett and Dominic Welsh, *Probability, an introduction*. Oxford Science Publications, 1986.

Laboratoire de Mathématiques et Physique Théorique
Université François-Rabelais Tours - Fédération Denis Poisson

cedric.lecouvey@lmpt.univ-tours.fr
emmanuel.lesigne@lmpt.univ-tours.fr