

Some references for J. Fulman's lectures "Stein's method and representation theory of the symmetric group"

Lecture 1:

For background on representation theory of the symmetric group see:

1. "The symmetric group: representations, combinatorial algorithms, and symmetric functions" by Bruce Sagan (2001), second edition. A superb book!
2. "Group representations in probability and statistics" by Persi Diaconis, IMS Lecture Notes, Volume 11 (1988). Gives applications to random walk and statistics. Extensive discussion of the symmetric group.

For Fourier analysis on finite groups, see 2) above, and also

3. "Fourier analysis on finite groups and applications" by Audrey Terras (1999).

For information about longest increasing subsequences, see

4. Longest increasing subsequences: from patience sorting to the Baik-Deift-Johansson theorem, Bull. AMS 36 (4) (1999) 413-432, by Aldous and Diaconis.

Lecture 2:

For background on Stein's method for normal approximation, see

5. Stein's method for normal approximation, by Chen and Shao (2005) in "An introduction to Stein's method"

For Kerov's original proof of the central limit theorem for character ratios (using the method of moments and intricate combinatorics), and the link with the fluctuation about the limit shape of Young diagrams, see the references

6. Kerov's central limit theorem for the Plancherel measure on Young diagrams, by Ivanov and Olshanski, in "Symmetric Functions 2001".

7. Quantum probability and spectral analysis on graphs (2007), by Hora and Obata – a book with a chapter on the topic.

For the Stein's method proof presented in the lecture, see

8. Stein's method and random character ratios, *Transac. Amer. Math. Soc.* (2008), 3687-3730, by Fulman.

Some other proofs of Kerov's central limit theorem are

9. Gaussian fluctuations of characters of the symmetric group and of Young diagrams, *Prob. Theory Relat. Fields* (2006), 263-297 by P. Sniady. (uses the method of moments and geometric arguments from Riemann surface theory)

10. Martingales and character ratios, *Transac. Amer. Math. Soc.* (2006), 4533-4552 by Fulman (uses martingale theory).

11. An inductive proof of the Berry-Esseen theorem for character ratios, *Ann. Combin.* (2006), 319-332 by Fulman (uses Bolthausen's version of Stein's method).