Some references for J. Fulman's lectures "Stein's method and compact Lie groups"

Lecture 1:

For background on representation theory of compact Lie groups see the texts:

1. Lie groups, by Dan Bump, 2004.

2. Representations of compact Lie groups, by Brocker and tom Dieck, 2003.

For random walk on compact Lie groups and character theory, one can consult:

3. The cut-off phenomenon for random reflections, by U. Porod, Ann. Probab. (24) 1996, 74-96.

For a gentle introduction to random matrices, see

4. Patterns in eigenvalues, by Diaconis, Bull Amer. Math. Soc. (40), 155-178, 2003.

For a more comprehensive treatment, see

5. Random matrices, by Mehta, Third edition (2004).

The book in preparation on random matrices by Anderson, Guionnet, and Zeitouni will be very good.

For random matrices in statistics, see the books

6. Multivariate analysis, by Mardia, Kent, and Bibby, 1979.

7. Aspects of multivariate statistical theory, by Muirhead, 1982.

Lecture 2:

For central limit theorems on traces of random matrices, some papers are

8. On the eigenvalues of random matrices, in J. Appl. Probab. Special Volume 31A (1994), by Diaconis and Shahshahani. (uses the method of moments and symmetric function theory; Macdonald's book "Hall polynomials" is the definitive text on symmetric function theory)

9. On random matrices from the compact classical groups, Ann. Math. (1997) 519-656, by K. Johansson (obtains exponentially sharp bounds using moments and characteristic function methods)

10. Brownian motion and classical Lie groups, in Probability, statistics, and their applications: papers in honor of Rabi Bhattacharya, IMS Lecture Notes 41, 2003. (studies Trace(AM) where A is fixed, M is random orthogonal).

For central limit theorems on traces of random matrices using Stein's method, one can consult

11. The accuracy of the normal approximation to the distribution of the traces of powers of random orthogonal matrices, by C. Stein, Stanford statistics dept. technical report no. 470, March 1995. (a hard-to-read paper full of ideas, with bounds almost as nice as those of Johansson)

12. Linear functions on the classical matrix groups, by E. Meckes, Trans. Amer. Math. Soc. (360), 2008 (studies Trace(AM) where A is fixed, M is random orthogonal).

13. On the approximate normality of eigenfunctions of the Laplacian, by E. Meckes, to appear in Trans. Amer. Math. Soc.

14. Stein's method and characters of compact Lie groups, by Fulman, to appear in Comm. Math. Physics.

15. Fluctuations of eigenvalues and second order Poincare inequalities, by S. Chatterjee, to appear in Prob. Theory Rel. Fields. (a terrific paper which deals with matrices where the entries are independent—not the case for compact Lie groups).