1035-43-1552   **Alexander C Russell*** (`acr@cse.uconn.edu`), Department of Comp. Sci. & Engr., U-2155, University of Connecticut, Storrs, CT 06268. *The Spectra of Random Cayley Graphs.*

We discuss spectral characteristics of the Cayley graphs obtained by selecting $n = n(|G|)$ elements, independently and uniformly at random, from a finite group G. In particular, we give a simple proof of the Alon–Roichman theorem, asserting that for $n = c_\epsilon \log |G|$ the resulting Cayley graph has expected second eigenvalue no more than ϵ; here c_ϵ is a constant depending only on ϵ. We discuss, also, how these methods can be used to estimate the number of solutions to families of equations over finite groups. (Received September 20, 2007)