

Meeting: 1000, Albuquerque, New Mexico, SS 1A, Special Session on Random Matrix Theory and Growth Processes

1000-60-76 **Alexei Borodin*** (borodin@caltech.edu), Mathematics 253-37, Caltech, Pasadena, CA 91125,
and **Eugene Strahov**. *Averages of Characteristic Polynomials in Random Matrix Theory*.

We compute averages of products and ratios of characteristic polynomials associated with Orthogonal, Unitary, and Symplectic Ensembles of Random Matrix Theory. The pfaffian/determinantal formulas for these averages are obtained, and the bulk scaling asymptotic limits are found for ensembles with Gaussian weights. Classical results for the correlation functions of the random matrix ensembles and their bulk scaling limits are deduced from these formulas by a simple computation.

We employ a discrete approximation method: the problem is solved for discrete analogues of random matrix ensembles originating from representation theory, and then a limit transition is performed. Exact pfaffian/determinantal formulas for the discrete averages are proved using standard tools of linear algebra; no application of orthogonal or skew-orthogonal polynomials is needed. (Received August 16, 2004)