

1085-82-234

**Virgil U Pierce\*** ([piercevu@utpa.edu](mailto:piercevu@utpa.edu)), Department of Mathematics, 1201 W University Drive, Edinburg, TX 78539. *The enumeration of odd valent maps with random matrix partition functions.*

The partition function of N-by-N hermitian random matrices has a natural interpretation in terms of a tau-function for the Toda lattice hierarchy. Continuum limits of the Toda hierarchy induce equations governing the behavior of the terms in the asymptotic expansion (in large N) of the logarithmic-partition function. These terms are also generating functions for the enumeration of maps (or ribbon graphs) partitioned by their genus. We have recently carried out this procedure in the case of maps with vertices of degree 3. We will illustrate the difficulties involved in lifting the results to higher valency numbers, in particular giving some explicit results in the case of degree 5 maps. (Received September 10, 2012)