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Virgil U Pierce* (piercevu@utpa.edu), University of Texas – Pan American, 1201 W University Drive, Edinburg, TX 78539. *Dispersionless limits of Hirota equations for map enumeration.*

The Hirota equations of the Toda lattice hierarchy express the conditions satisfied by the tau functions generating solutions to the hierarchy. The tau functions for special initial conditions have combinatoric meaning, coming from the partition function of random matrices for the Gaussian unitary ensemble, their asymptotic expansion gives generating functions for the enumeration of maps (or ribbon graphs) partitioned by genus. The asymptotic expansion of the tau functions induces a dispersionless limit on the Hirota equations which can then be used to determine the precise structure of the generating functions. For example in some cases we find explicit formulas for the generating functions. We will give some of the progress being made on this enumeration problem, including symmetry results and connections with non-orientable generalizations coming from the Hirota equations for the Pfaff lattice hierarchy. (Received September 16, 2013)