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It is well known that many integrable systems are connected to orthogonal functions. These orthogonal functions appear as a wave function of the Lax pair and their spectral transformations correspond to the flow of the continuous and discrete integrable systems. From the point of view, several new integrable systems have been proposed. We focus on the skew orthogonal polynomials (SOPs) which are originally introduced in the random matrix theory in order to calculate the correlation function of the orthogonal or symplectic ensembles. One of the corresponding continuous integrable systems is already known as Pfaff lattice but the corresponding discrete integrable system remains to be found.

In this talk, the discrete spectral transformation of SOPs is presented and its relation to the random matrix theory is also discussed. From the spectral transformation, the corresponding discrete integrable systems are derived both in $1 + 1$ and $2 + 1$ dimensional case. Especially, in $2 + 1$ dimensional case, such system can be extended to 2×2 matrix form. (Received September 15, 2011)