Toric degenerations of Gelfand-Cetlin systems and potential functions

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May 6 - 10, 2009

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Abstract

It is well known that a polarized toric variety is related to a moment polytope in two different ways, monomial basis and the moment map. Also in the case of flag manifolds of type A, certain polytopes, called the Gelfand-Cetlin polytopes, appear in different stories: the Gelfand-Cetlin basis [1], a basis of an irreducible representation; and the Gelfand-Cetlin system [3], a completely integrable system. Furthermore the flag manifold admits a degeneration into the toric variety corresponding to the Gelfand-Cetlin polytope ([2]). Kogan and Miller [4] proved that the Gelfand-Cetlin basis can be deformed into monomial basis on the toric variety under the degeneration. We show that the Gelfand-Cetlin system can be deformed into a moment map on the toric variety. We also apply the result to disk counting and calculate the potential function for a Lagrangian torus fiber of the Gelfand-Cetlin system. This is a joint work with T. Nishinou and K. Ueda.

References


