A new recursion relation for ABJ matrix models

Wednesday, 29 November 2023 15:00 (15 minutes)

We find new bilinear relations for the partition functions of $U(N)_k \times U(N + M)_{-k}$ ABJ theory with two parameter mass deformation (m1,m2), which generalize the q-Toda-like equation found previously for m1=m2. By combining the bilinear relations with the Seiberg-like dualities and the duality cascade relations, we can determine the closed form expressions of the partition functions recursively with respect to N. This method is more efficient than the exact calculation by the standard TBA-like approach in the Fermi gas formalism. As an application we study the large N asymptotics of the partition function with the mass parameters in the supercritial regime where the large N expansion obtained for small mass parameters is invalid.

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