

# 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  $(m_1, m_2)$ , which generalize the  $q$ -Toda-like equation found previously for  $m_1 = m_2$ . 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 supercritical regime where the large  $N$  expansion obtained for small mass parameters is invalid.

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