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## A POISSON TYPE OPERATOR DEFORMED BY GENERALIZED FIBONACCI NUMBERS AND ITS COMBINATORIAL MOMENT FORMULA

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In this talk, we provide the Poisson counterpart to the  $(q, t)$ -Gaussian operator on the  $(q, t)$ -Fock space. That is, we examine a two-parameter deformation of the classical Poisson random variable, namely, the  $(q, t)$ -Poisson type operator on the  $(q, t)$ -Fock space. We introduce the  $(q, t)$ -Charlier polynomials associated with the  $(q, t)$ -Poisson distribution, extending the  $q$ -deformation of Saitoh-Yoshida (2000) which is recovered when  $t = 1$ . The deformation treated in this work can be understood naturally as an analogue originating from the classical Poisson limit theorem from the viewpoint of orthogonal polynomials. Moreover, we provide the combinatorial moment formula of the  $(q, t)$ -Poisson type operator by employing set partitions and a card arrangement technique along with their statistics. A combinatorial symmetry on the generalized Fibonacci numbers, referred to as  $(q, t)$ -numbers, is explicitly realized by means of this card arrangement, providing a concrete representation of the duality between crossings and nestings of partitions. As a result, our method establishes a natural bridge between probabilistic and combinatorial interpretations for the  $(q, t)$ -Poisson type operator. This is based on the paper arXiv:2508.12659.

Joint work with Nobuhiro Asai, Marek Bożejko, and Hiroaki Yoshida.