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Karim S.N.<sup>a</sup>, Hamzah N.Z.A.<sup>a</sup> ✉, Fauzi N.N.M.<sup>a</sup>, Ganikhodjaev N.<sup>b</sup>

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## Abstract

The idea of quadratic stochastic operator (QSO) which was originally introduced by Bernstein in the early 20th century through his work on population genetics has been significantly developed for decades to describe dynamical systems in many areas. In this research we construct the dynamical systems generated by a new class of 2-class partition of Poisson QSO defined on countable state space,  $X = \{0, 1, 2, \dots\}$ . Our main goal is to investigate the trajectory behavior of such operators by reducing its infinite variables into a one-dimensional setting that correspond to the number of defined partitions. We present some cases of 2-measurable partition with singleton and two points of two different parameters. Measure and probability theory alongside the functional analysis will be applied to investigate the limit behavior and characteristics of fixed points. These results suggest that the QSO generated by a 2-measurable partition defined on countable state space for both singleton and two points of two different parameters is a regular transformation for some values of parameters. © Published under licence by IOP Publishing Ltd.

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