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Satsuki Nishimura "Exploring the flavor structure of quarks and leptons with reinforcement learning"

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We propose a method to explore the flavor structure of quarks and leptons with reinforcement learning, which is a type of machine learning. As a concrete model, we focus on the Froggatt-Nielsen model with U(1) flavor symmetry. By training neural networks on the U(1) charges of quarks and leptons, the agent finds 21 models to be consistent with experimentally measured masses and mixing angles of quarks and leptons. The normal ordering of neutrino masses is well fitted with the current experimental data in contrast to the inverted ordering. The method with reinforcement learning could be a new analytical technique to flavor physics, and we adapt this approach to modular flavor models also. The reference is arXiv:2304.14176 [hep-ph].

Session Classification: Short talks