

Contribution ID: 41

Type: not specified

Spontaneous CP Violation in an Axion Model: Implications for Leptonic Flavor and the Minimal Seesaw

Friday, 4 July 2025 15:30 (30 minutes)

We investigate an extension of the Dine–Fischler–Srednicki–Zhitnitsky (DFSZ) axion model that realizes spontaneous CP violation and explores its implications for leptonic flavor structure within the framework of the minimal seesaw mechanism. By introducing singlet heavy Majorana neutrinos and an additional complex singlet scalar, we construct the extended Yukawa and scalar sectors necessary for radiatively generating the CP-violating quartic couplings at the 1-loop level. We demonstrate that the CP phase arising from the spontaneous breaking of symmetry propagates into the lepton sector, influencing the Dirac neutrino mass matrix and, consequently, the CP-violating phases of the Pontecorvo–Maki–Nakagawa–Sakata (PMNS) matrix. A benchmark numerical analysis confirms the compatibility of the model with current neutrino oscillation data and illustrates how low-energy leptonic CP violation can originate from the extended scalar dynamics. This framework offers a coherent link between axion physics, spontaneous CP violation, and the flavor structure of neutrinos.

Primary author: KANG, Sin Kyu (Seoul National University of Science and Technolofy)Presenter: KANG, Sin Kyu (Seoul National University of Science and Technolofy)Session Classification: Afternoon session