Contribution ID: **52** Type: **Talk**

Axion QED as a Lattice Gauge Theory and Non-Invertible Symmetry

Tuesday, 30 July 2024 11:55 (20 minutes)

We formulated axion QED on a lattice using a modified Villain formalism. While the axion-photon coupling in the continuum theory is straightforward, we found that the corresponding coupling in the lattice gauge theory using the modified Villain formalism is more complex. As a result, we discovered that the gauge-invariant ‘t Hooft loop requires a surface inside it. Additionally, we discussed the non-invertible symmetry related to the axion’s 0-form shift symmetry, namely the axial transformation. In the continuum theory, it has been reported that a membrane is stretched inside the ‘t Hooft loop under the action of the non-invertible symmetry operator. However, starting from our formulation, we demonstrated that no nontrivial change occurs to the ‘t Hooft loop under such an action.

Primary author: HONDA, Yamato (Kyushu university)

Co-authors: ONODA, Soma (Kyushu University); SUZUKI, Hiroshi (Kyushu University)

Presenter: HONDA, Yamato (Kyushu university)

Session Classification: Theoretical developments

Track Classification: Theoretical Developments