Contribution ID: **104** Type: **Poster**

Searching for high-frequency axion in quantum electromagnetodynamics through interface haloscopes

Friday, 2 June 2023 19:55 (5 minutes)

The so-called Witten effect implies a close relationship between axion and magnetic monopole. A sound quantization in the presence of magnetic monopoles, called quantum electromagnetodynamics (QEMD), was utilized to construct a more generic axion-photon Lagrangian in the low-energy axion effective field theory. This generic axion-photon Lagrangian introduces the interactions between axion and two four-potentials, and leads to new axion-modified Maxwell equations. The interface haloscopes place an interface between two electromagnetic media with different properties and are desirable to search for high-mass axions $m_a \geq \mathcal{O}(10)$ μeV. In this work, for the generic axion-photon couplings built under QEMD, we perform comprehensive calculations of the axion-induced propagating waves and energy flux densities in different interface setups. We also obtain the sensitivity to new axion-photon couplings for high-mass axions.

Primary authors: LI, TONG (Nankai University); 代, 昌杰 (Nankai University); ZHANG, RUIJIA (Nankai University)

Presenter: 代, 昌杰 (Nankai University)

Session Classification: Poster session and buffer dinner