



Contribution ID: 55

Type: **not specified**

WISPF1-E: WISP searches on a Fiber Interferometer under the application of an Electric field

Monday, 3 July 2023 18:05 (3 minutes)

The search for dark matter axions is an ongoing challenge for modern physics, and conventional searches typically involve the use of external magnetic fields to detect axions. However, these experiments are not sensitive to the axion-photon couplings g_{aAB} and g_{aBB} predicted in scenarios based upon modified Quantum-Electrodynamics. We propose here a novel approach to search for resonant photon-axion conversion by integrating hollow-core photonic crystal fibers (HC-PCF) in a Mach-Zehnder interferometer and measuring changes in amplitude/phase. By attaching electrode strips to the HC-PCF, it is possible to probe the photon-axion conversion under the application and modulation of strong electric fields. The application of an electric field of $\sim 5 \text{ MV/m}$ or higher will allow us to achieve sensitivity levels comparable to those of conventional searches conducted with external magnetic fields of the order of $\sim 14T$. This can significantly decrease the experimental cost and can also allow for a much higher sensitivity. By overcoming the technological challenges of generating such high electric fields, this approach can open up additional unique opportunities in direct dark matter searches.

Primary author: BATLLORI BERENGUER, Josep Maria

Presenter: BATLLORI BERENGUER, Josep Maria

Session Classification: Poster Session