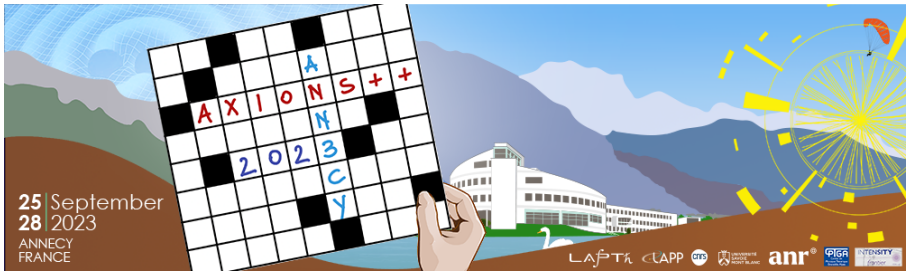

ID de Contribution: **30** Type: **Non spécifié**

WISPFI: WISP Searches on a Fiber Interferometer

mardi 26 septembre 2023 16:55 (20 minutes)

WISP Searches on a Fiber Interferometer (WISPFI) is a novel tabletop experiment using interferometric techniques applied to photonic crystal fibers searching for a resonant photon-axion conversion. It is independent of the local dark matter density which can highly reduce the sensitivity of axion experiments and could as well be the reason behind the null results of dark matter searches so far. The experimental setup consists of a partial fiber, partial free-space Mach-Zehnder-type interferometer. In the sensing arm, the fiber is coiled and can be placed inside the bore of a superconducting solenoid magnet (14T, 140mm
diameter warm bore) or can be attached to electrode strips in order to apply a strong modulated electric field, producing photon-axion mixing. The photon-axion oscillations would then be detected by measuring changes in phase/amplitude. For the detection at resonant mixing, hollow-core photonic crystal fibers (HC-PCF) will be used, while regulation of the gas pressure inside the fiber will allow probing a wide range of axion masses. WISPFI's unique setup focuses on large axion masses around 100meV while reaching the QCD band so far unexplored by other experiments. A scalability of the experiment together with the involvement of state-of-the-art photonic techniques allow even a DFSZ sensitivity while probing dark matter axions in a very wide and unexplored mass range. In addition, The setup can be optimized for working close to vacuum-like conditions by highly pressurizing the fiber to extend the range to lower masses.

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