Contribution ID: **95** Type: **Presentation**

Heterodyne detection in ALPS II

Thursday 21 June 2018 17:05 (5 minutes)

The ALPS II experiment searches for axion-like particles (ALPs) using the "light shining through a wall"technique. The collaboration is currently developing two different detection methods both targeting sensitivities to photon levels as low as a few photons per week. One approach, based on photon counting, uses a Transition Edge Sensor while the other involves heterodyne interferometry.
Heterodyne detection takes advantage of the coherent nature of the regenerated photon signal. However, it also relies on the ability to track precisely the phase of the expected signal with a precision better than 0.1 cycles over integration times of several weeks.
I will report on the design and measurements of the planned heterodyne optical setup.

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Session Classification: Plenary short presentations