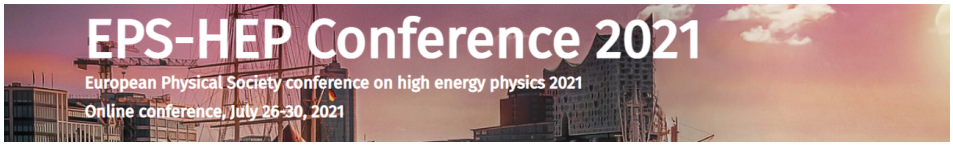

Contribution ID: **713** Type: **Parallel session talk**

Towards New Particle Discoveries: the ALPS-II Experiment Shines Soon*

Thursday 29 July 2021 11:10 (20 minutes)

The version II of the Any Light Particle Search (ALPS) experiment is projected to be one of the most sensitive experiments for axion-like particles. Such particles are a solution to the strong CP problem in quantum chromodynamics (QCD) as well as potential dark matter candidates. Based on theory, the axion-like particles are weakly interacting with matter, making them invisible to regular detectors. However, and fortunately, these "invisible"particles are predicted to be coupled with light, with a certain conversion probability, in the presence of a strong magnetic field. This prediction opened up a way for a potential detection of these particles via optics. ALPS is a light shining through a wall (LSW) experiment where the production of the axion-like particles would be occurring in a pure laboratory setting: a high power laser will shine through a string of 12 superconducting HERA dipole magnets, located in the HERA tunnel at DESY in Hamburg, Germany. At the end of these magnets, a "wall"will block the laser light while the axion-like particles would pass through it towards a second similar set of 12 HERA magnets, which would regenerate a tiny amount of the axion-like particles back to detectable photons. Also, by implementing two high finesse 124 m baseline Fabry-Perot cavities at the production and regeneration sides, ALPS-II could increase its upper limit sensitivity in the coupling factor between the axion-like particles and the photons down to $g_{a\gamma\gamma} = 2 \times 10^{-11}\text{GeV}^{-1}$. I will report on the optics commissioning status and its stages which started at the beginning of this year, on the latest milestones that we have reached, and finally on the science runs and results that we are expecting from our experiment.

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Collaboration / Activity

ALPS colaboration

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