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## The ALPS II and BabyIAXO Experiments at DESY: Particle Physicists Hunting for Axions, Axion-Like-Particles and More, Independent of a Dark Matter Paradigm

Light-shining-through-wall (LSW) and helioscope experiments are designed for generic searches of axions and axion-like-particles (ALPS), relying only on either self-made particles or solar emission. Typically, both experimental approaches utilise the conversion of these particles into photons in the presence of a strong external magnetic field (Sikivie effect) for detection. While LSW experiments, generating laboratory axions and ALPS via the inverse effect, are conceptually model independent, helioscope searches partly rely on solar and axion models.

At DESY, both approaches are realised with the next generation state-of-the-art experiments, reusing the old HERA infrastructure, in the form of the Any Light Particle Search II (ALPS II) and the Baby International Axion Observatory (BabyIAXO). While ALPS II has started data taking in May 2023, first operation of BabyIAXO is expected by the end of the decade. Both experiments will operate with unprecedented sensitivities and therefore probe large unexplored parameter space. In addition, the possibility to probe different axion couplings with BabyIAXO and the combination with ALPS II results will provide the unique opportunity to go beyond potential discovery and probe the nature of the underlying model, independent of any Dark Matter hypothesis.

After a brief introduction to the general experimental concepts and the status of the two experiments, this contribution will focus on the science case with a special emphasis on a post-discovery scenario. After highlighting the synergies of ALPS II and BabyIAXO in such a scenario, also their potential to turn into multipurpose facilities for further searches is shortly discussed.

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