

Axion search with BabyIAXO in view of IAXO

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Axions are a natural consequence of the Peccei-Quinn mechanism, the most compelling solution to the strong-CP problem. Similar axion-like particles (ALPs) also appear in a number of possible extensions of the Standard Model, notably in string theories. Both axions and ALPs are very well motivated candidates for Dark Matter, and in addition, they would be copiously produced at the sun's core. A relevant effort during the last decade has been the CAST experiment at CERN, the most sensitive axion helioscope to-date. The International Axion Observatory (IAXO) is a large-scale 4th generation helioscope. As its primary physics goal, IAXO will look for solar axions or ALPs with a signal to background ratio of about 5 orders of magnitude higher than CAST. Recently the IAXO collaboration has proposed an intermediate experimental stage, BabyIAXO, conceived to test all IAXO subsystems (magnet, optics, detectors and sun-tracking systems) at a relevant scale for the final system and thus serve as pathfinder for IAXO but at the same time as a fully-fledged helioscope with record and relevant physics reach in itself with potential for discovery.

BabyIAXO was endorsed by the Physics Review committee of DESY last May 2019. Here we will review the status and prospects of BabyIAXO and its potential to probe the most physics motivated regions of the axion & ALPs parameter space.

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