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Latest results of CAST and future prospects

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The status of the solar axion search with the CERN Axion Solar Telescope (CAST) will be discussed. The latest results from the second part of CAST phase II where the magnet bores were filled with 3He gas at variable pressure scanning axion masses up to 1.2 eV will be presented. In 2013 CAST has improved its sensitivity to solar axions with rest mass below 0.02 eV/c2 by upgrading the Micromegas detectors and it will continue in 2014 with the implementation of a second X-ray optic and a new type of detector (InGRID). In addition, CAST has extended its sensitivity into the sub-keV energy range using a silicon detector (SDD), to search for solar chameleons. Thus, CAST also became sensitive to dark energy particles. A description of the upgrades will be given together with preliminary results on the chameleons search. A new generation axion helioscope (IAXO) aims to improve the current axion-photon coupling by 1-1.5 order of magnitudes. This will be possible by building a dedicated magnet and dedicated optics and X-ray detectors.

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