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## **GridPix detectors from CAST to IAXO**

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In the scope of the search for axions and axion like particles (Alps) a detector especially built for low energy Xrays based on the GridPix technology was developed at the University of Bonn. The GridPix is a MicroMegas like readout consisting of a pixelized readout ASIC (Timepix) with a perfectly aligned gas amplification stage, which is photolithographically built on top of the ASIC. Resulting in a very high granularity this detector is capable of detecting single electrons allowing the measurement of low energy X-rays down to the 200 eV range. To convert these the X-rays into electrons a small gas volume is built above the readout sealed with an X-ray entrance window.

This detector was successfully used in two data taking campaigns 2014/15 and after that with major upgrades in 2017/18 at the CAST experiment. The already analysed data from the 2014/15 campaign led to new limits on the chameleon photon coupling, while the recorded data from the second campaign is still under analysation promising even better result.

While the detector used in 2014/15 was rather simple, containing one GridPix and a window made out of 2 µm mylar glued on a copper strong back, the detector for the 2017/18 run was majorly improved for background reduction. First, two active moun vetos have been implemented. Second, the central GridPix was surrounded by 6 veto GridPixes and actively water cooled. Third, the mylar window was exchanged by a 300 nm silicon nitride window leading to a better transmission especially in the energy regime below 3 keV.

This started the development of the IAXO detector with the goal to achieve even lower backgrounds. For this the selection of special radiopure materials is required as well as a veto system for offline suppression of background events is necessary. Also the successor of the Timepix, Timepix3 will be introduced leading to a nearly dead time free data taking and the ability of a 3D-event reconstruction.

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