

## Pixel column issue in the ATLAS ITk Pixel Modules

*Wednesday 5 February 2025 10:00 (15 minutes)*

Pixel modules are currently being built for the ATLAS ITk Pixel detector upgrade.

Since the preproduction phase, recurring chip malfunctioning was observed during electrical testing, that was bypassed by disabling some pixel core columns in the ITkPix readout chip.

This issue is therefore called the "core column issue" which is a direct disqualifier for a pixel module.

A concerning number of cases has been observed in pixel modules with ITkPix v1.1 as well as v2 chips which would lead to unacceptable module yield.

However, the behaviour is erratic and there is no smoking gun hinting at the origin of this issue.

In this contribution we want to present our debugging process, highlight the electrical behaviour during testing, present findings in the data collected via our production database and through visual inspection, and point towards possible causes of the issue.

**Author:** MENG, Lingxin (Lancaster University (GB))

**Co-authors:** SHARMA, Abhishek (CERN); KORN, Andreas (University College London (GB)); HULTQUIST, Charles Elliott (Lawrence Berkeley National Lab. (US)); BUTTAR, Craig Macleod (University of Glasgow (GB)); KIM, Doyeong (Argonne National Laboratory); THOMPSON, Emily Anne (Lawrence Berkeley National Lab (US)); HUEGING, Fabian (University of Bonn (DE)); LODDO, Flavio; CRESCIOLI, Francesco (Centre National de la Recherche Scientifique (FR)); CALDERINI, Giovanni (LPNHE-Paris, Centre National de la Recherche Scientifique (FR)); PERNEGGER, Heinz (CERN); METCALFE, Jessica Stearns (CERN); PATER, Jo (University of Manchester (GB)); CHRISTIANSEN, Jorgen (CERN); BACKHAUS, Malte (ETH Zurich (CH)); MARJANOVIC, Marija (University of Oklahoma (US)); SCHUSSLER, Matthias (University of Bonn (DE)); SAMY, Md Arif Abdulla (University of Glasgow (GB)); Dr BATES, Richard (University of Glasgow (GB)); HIROSE, Shigeki (University of Tsukuba (JP)); HEIM, Timon (Lawrence Berkeley National Lab. (US)); DIETER, Yannick Manuel (University of Bonn (DE))

**Presenter:** MENG, Lingxin (Lancaster University (GB))

**Session Classification:** Electronics and System issues

**Track Classification:** System Issues