

UiO ITK Status: Assembly of R0 Triplets

ATLAS Upgrade meeting in Oslo

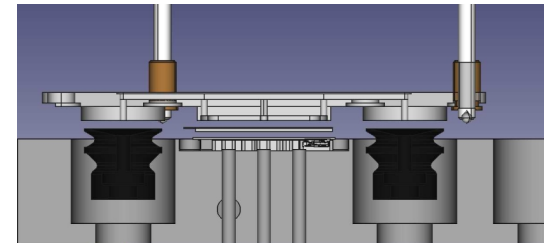
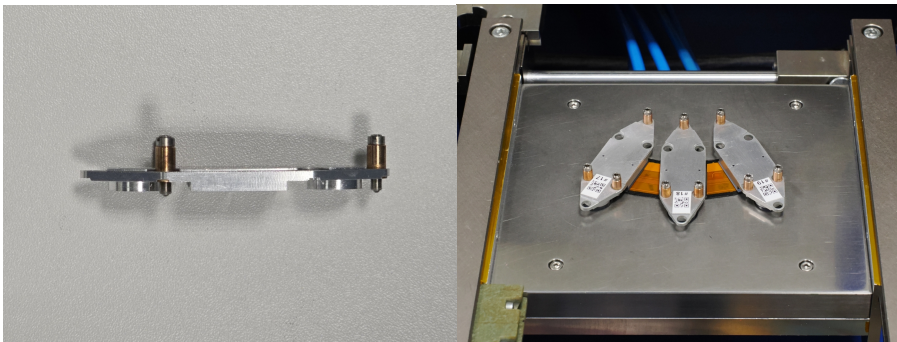
Aleksei Grigorev, on behalf of the Oslo group

25th June, 2024



Pick-and-place machine Zevac Onyx 32 used for glue stamping and assembly:

- Flex placed on a vacuum chuck with a 3D printed TPU 85 (Shore hardness 85A) inlay, flatness checked with a Z-probe measurement.
- Glue stamping – 3 positions on the flex stamped with a 3D-printed stamp.
- Bridge picked up by robot's vacuum head, placed on top of chip, picked up again, aligned to the machine's coordinate system.
- Chip with bridge on top placed to the corresponding position.
- Chips held in place by vacuum through bridge. Once all three chips are placed, vacuum to the flex disengaged to prevent glue spills.



Exploded cross section view

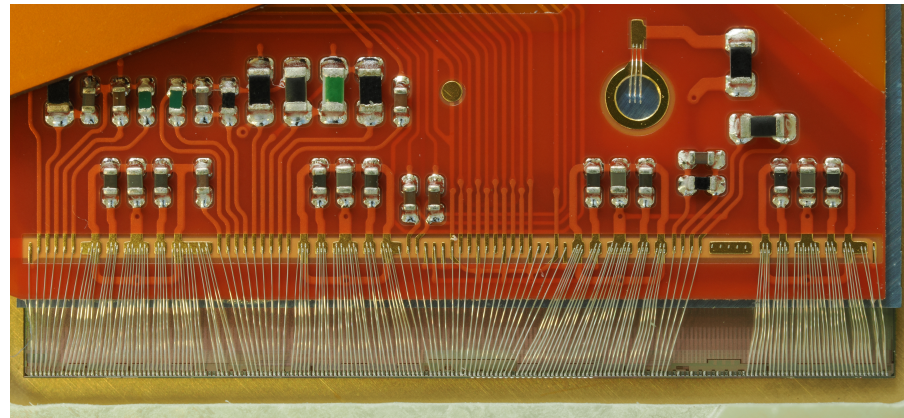
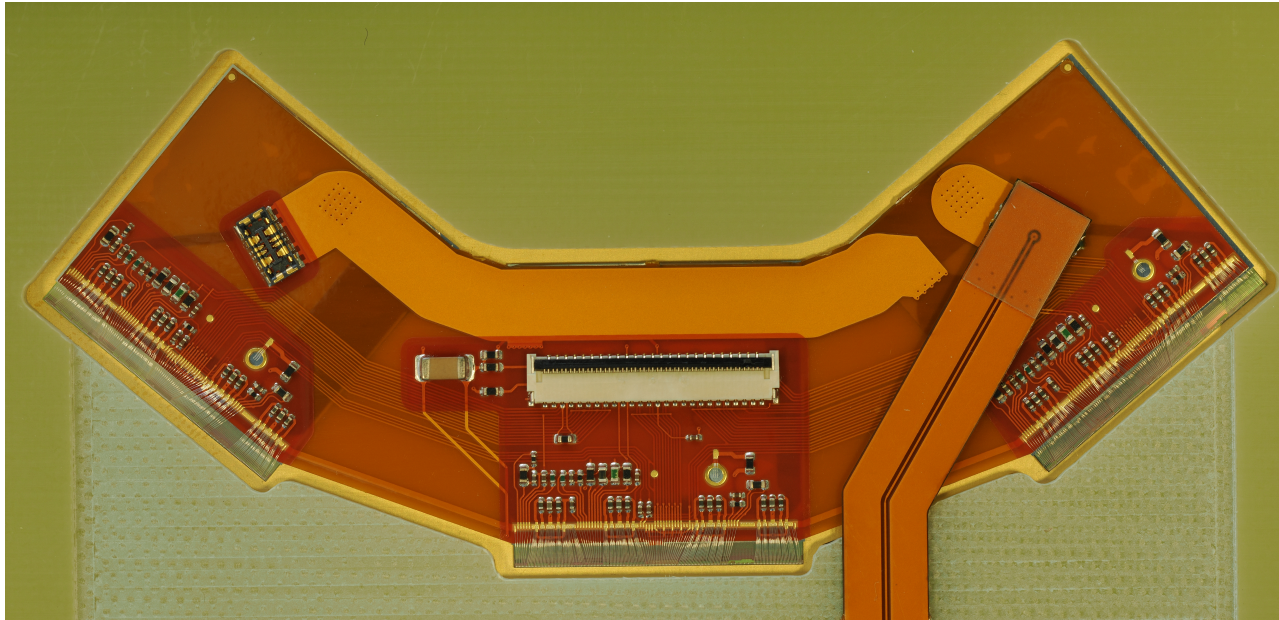
Assembled full R0 triplets in Oslo

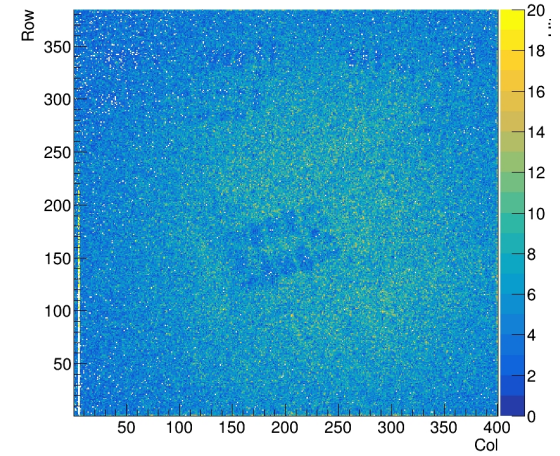
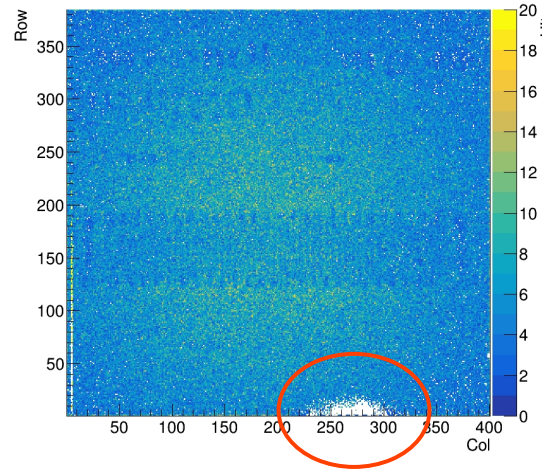
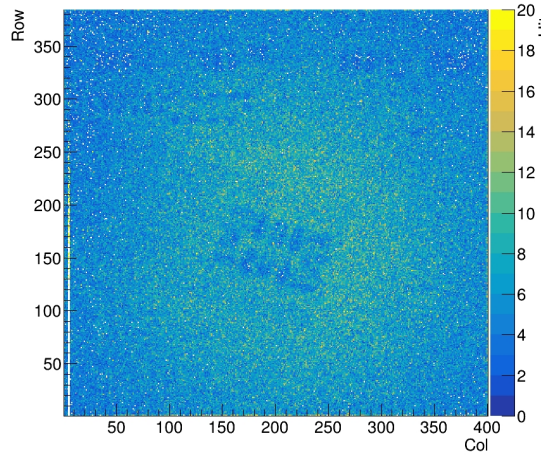
Assembled triplet modules

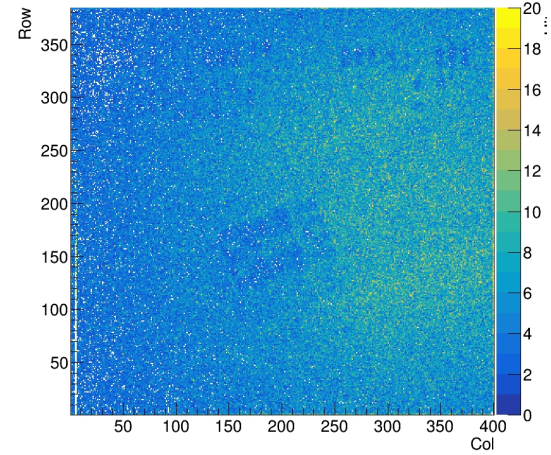
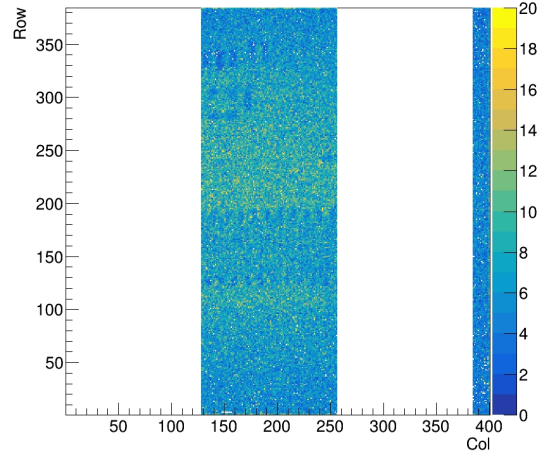
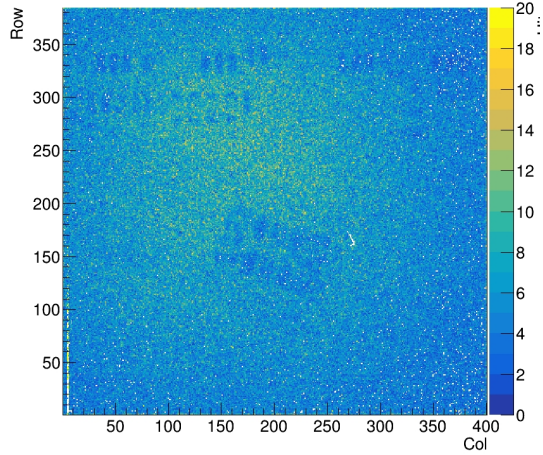
ATLAS SN	Type	BM/FE	Purpose	Quality	Comment
20UPIM02202149	Full	SINTEF/IZM, first batch	Fast track	OK, with problems	Delaminated corners, as expected, possibly for loading
20UPIM02202112	Full	SINTEF/LND	Fast track	With problems	Significant delamination, possibly for Bergen SQ
20UPIM02202113	Full	SINTEF/LND	Fast track	Not usable	Significant delamination, first BM coming apart
20UPIM02202131	Full	SINTEF/IZM, double glass	Fast track	Good	Chip 1 and 3 good, chip 2 some delamination in two corners
20UPIM02202124	Full	FBK/IZM	Loading	Good	All good
20UPIM02202125	Full	FBK/IZM	Loading	Testing	Middle chip with lots of dis. core columns
20UPIR73202121	Digital	ITkPixV2	Test V2	Testing	-

Triplets to build:

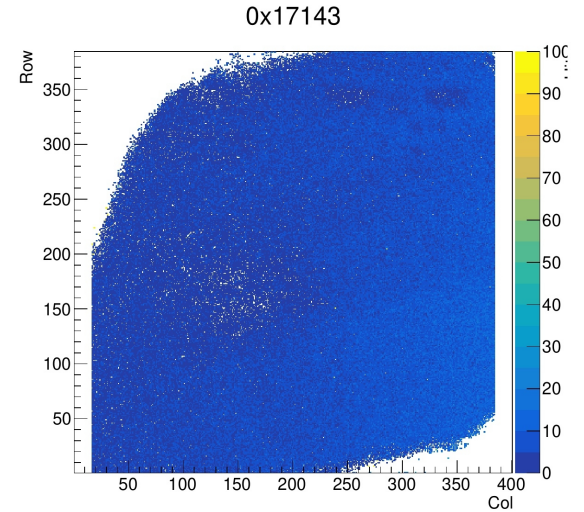
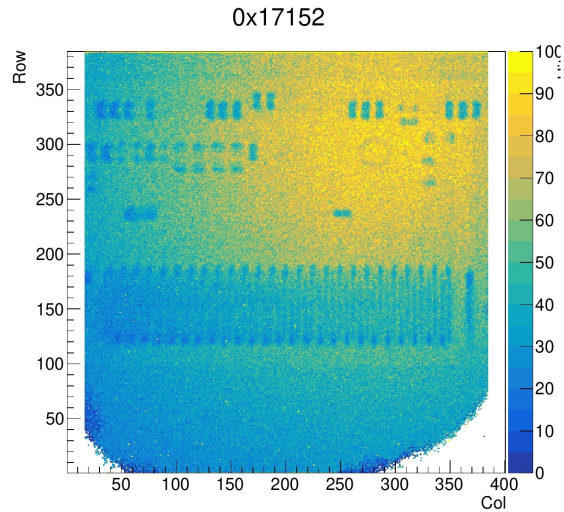
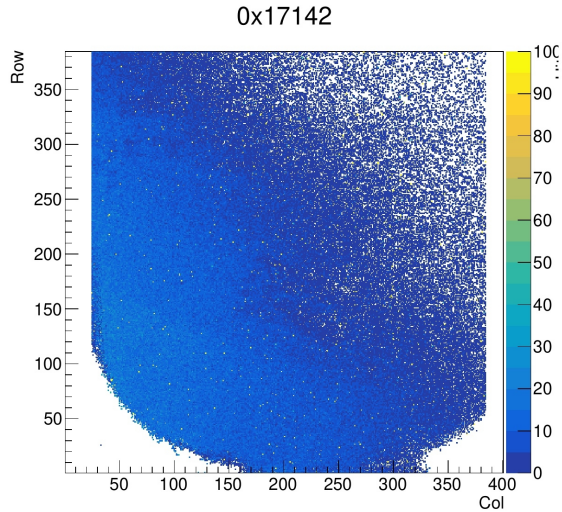
- 2 SINTEF/IZM to check new passivation, for delamination studies.
- Possibly 1 additional FBK/IZM triplet for loading.



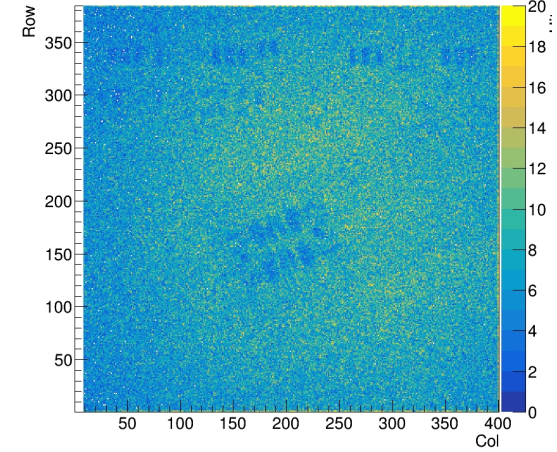
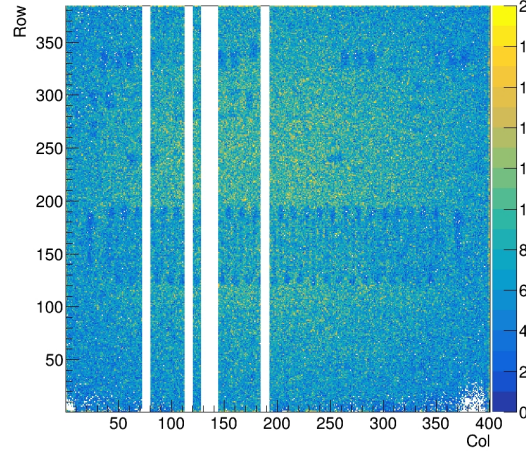
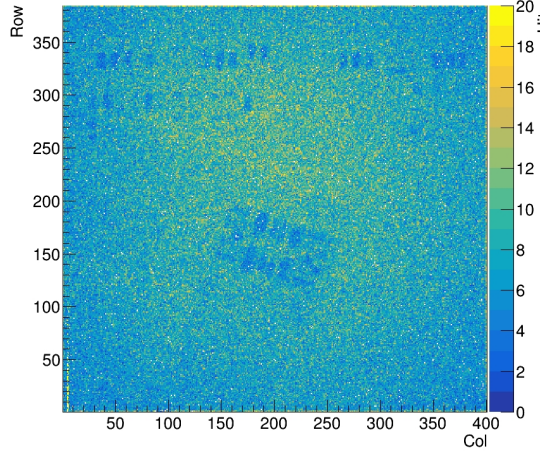




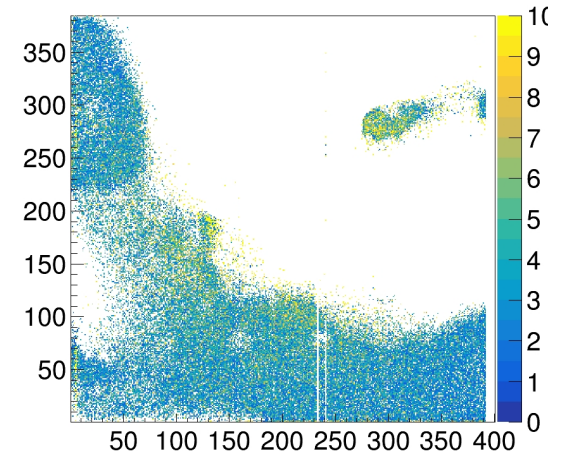
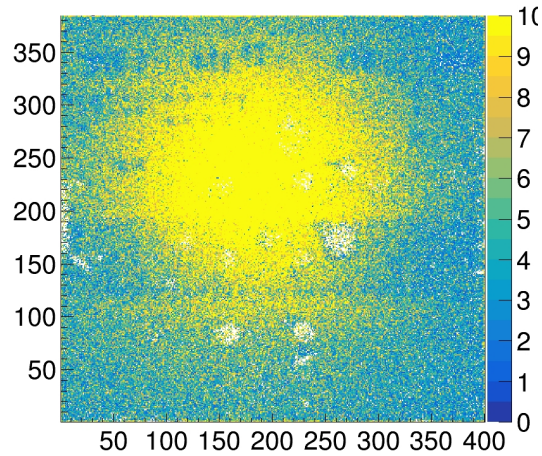
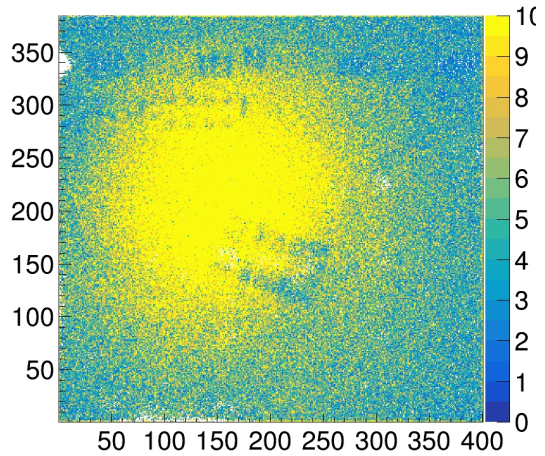
Had to run YARR scans and tunes for chips 1 and 3 separately from 2.
Still have errors if run all three chips enabled even after tuning (scans work, if disable chip 2 or enable only chip 2).

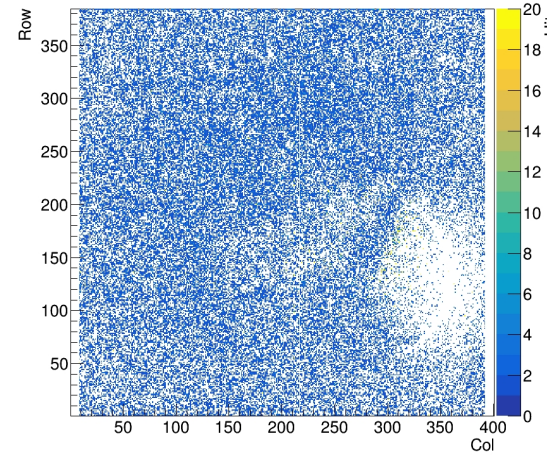
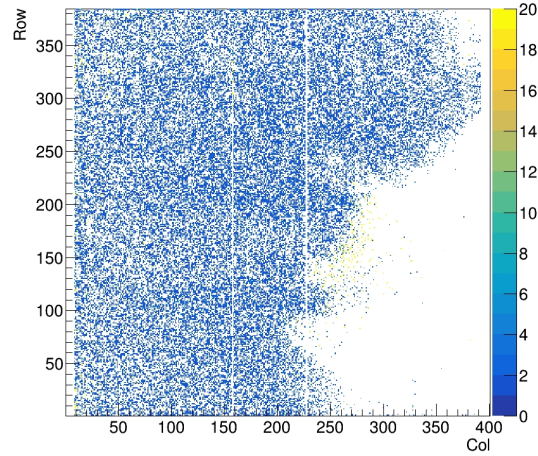
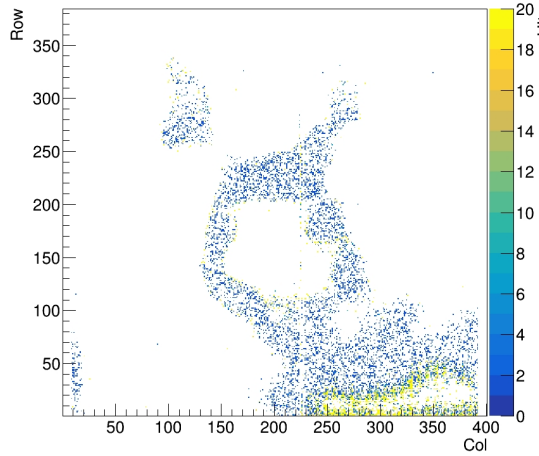


SINTEF/IZM 20UPIM02202131 (double-glass)



Had to disable several core columns for the middle chip, otherwise the module is good.





Chips 1 started coming apart during wire bonding, had to use some glue.

Could not run source scan for long due to errors.