

Status of Barrel EMC



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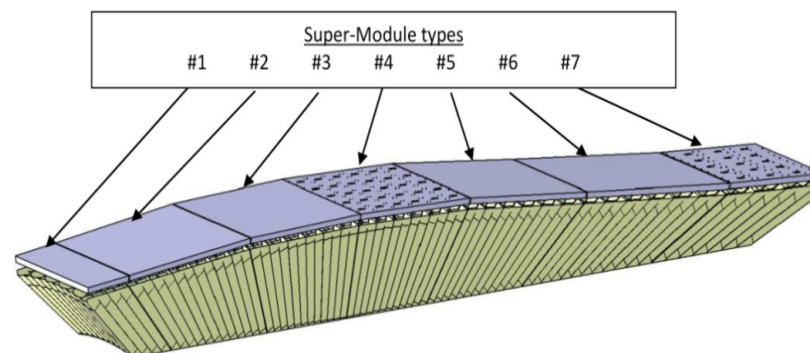
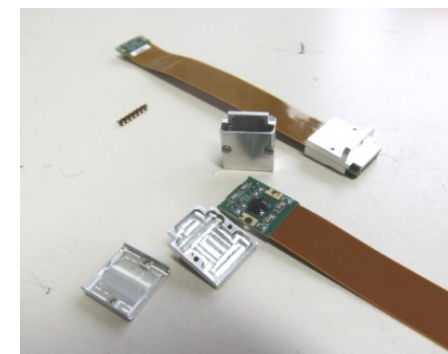
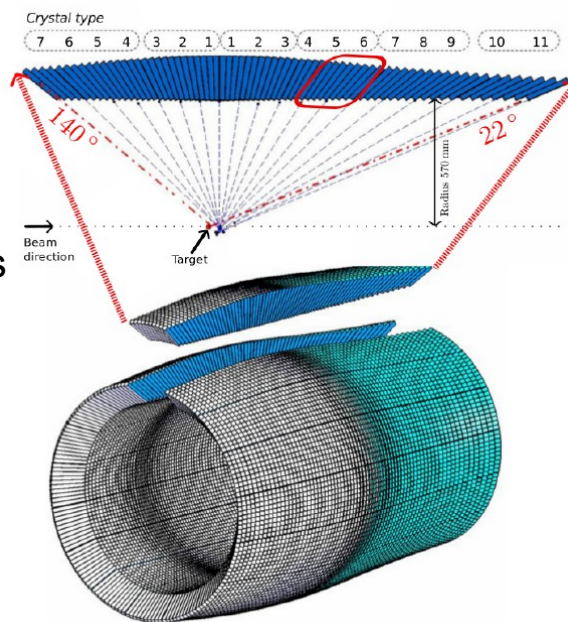


PANDA CM, EMC Session
Mar 7, 2018

Overview

- **Envisaged milestones:**
Assembly of 1st full Barrel EMC slice

- Infrastructure
- Mechanics (not approved yet)
- 710 detectors
 - 710 crystals in 11 different geometries
 - 1420 APDS
 - Screening including irradiation
 - Matching
 - Glueing
 - Capsules
 - Wrapping
- Assembly of 18 modules
- Assembly of Supermodules
 - 360 left and 360 right handed APFEL-ASIC with flex PCBs
 - ASIC housing or fixtures
- Assembly of slice
 - Cooling
 - Isolation
 - Backplanes
 - Cables
 - Light pulser fiber coupling



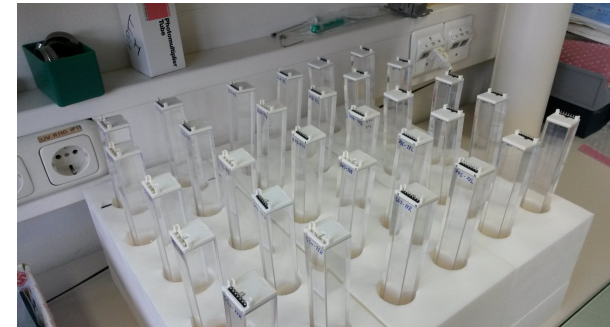
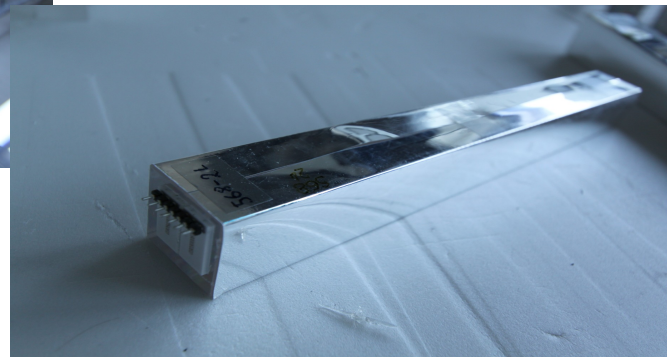
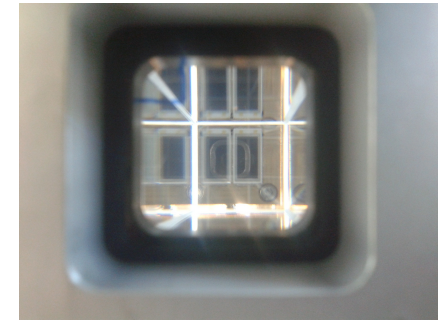
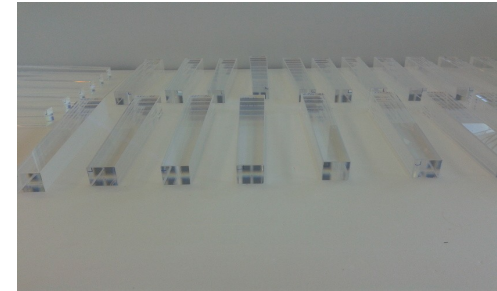
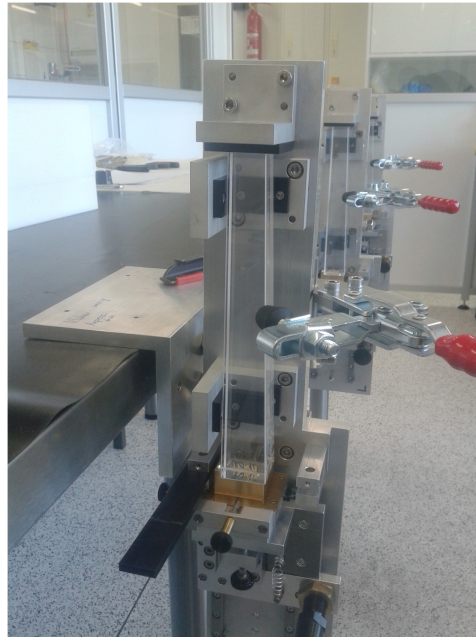
Detector Assembly

Glueing of APDs

Precisely defined sequence of procedures, e.g. glue film thickness, glueing force, curing time and conditions

Wrapping in reflective foils

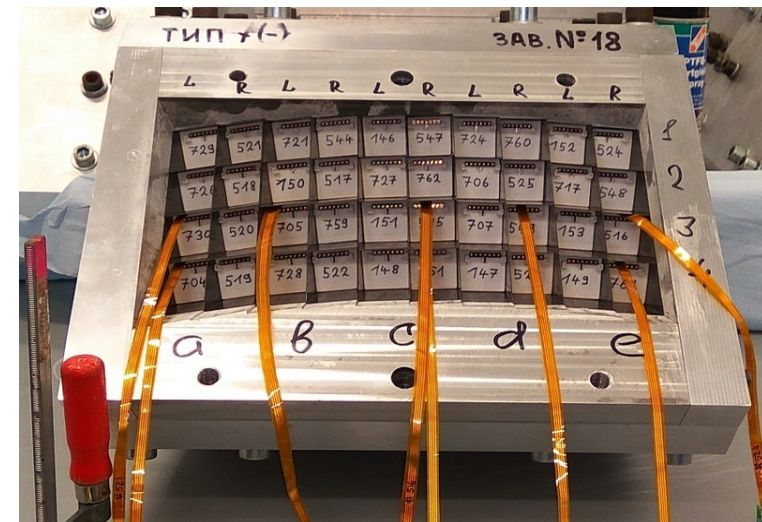
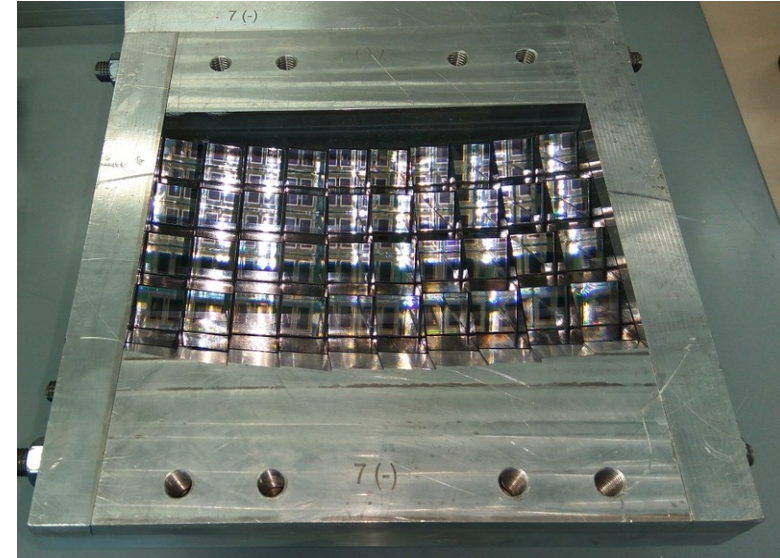
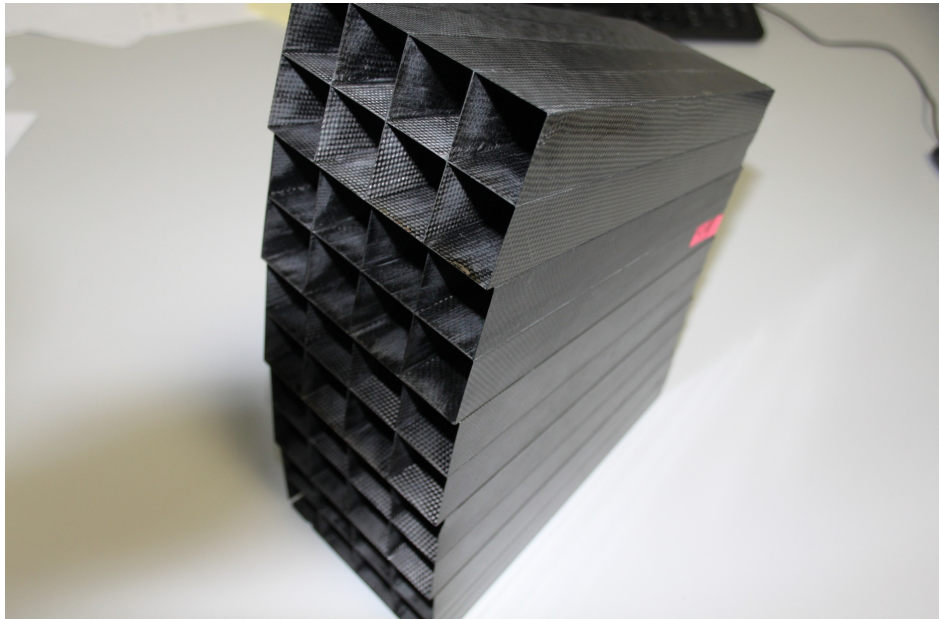
Precision Laser cut VM2000 foils (22 geometries)



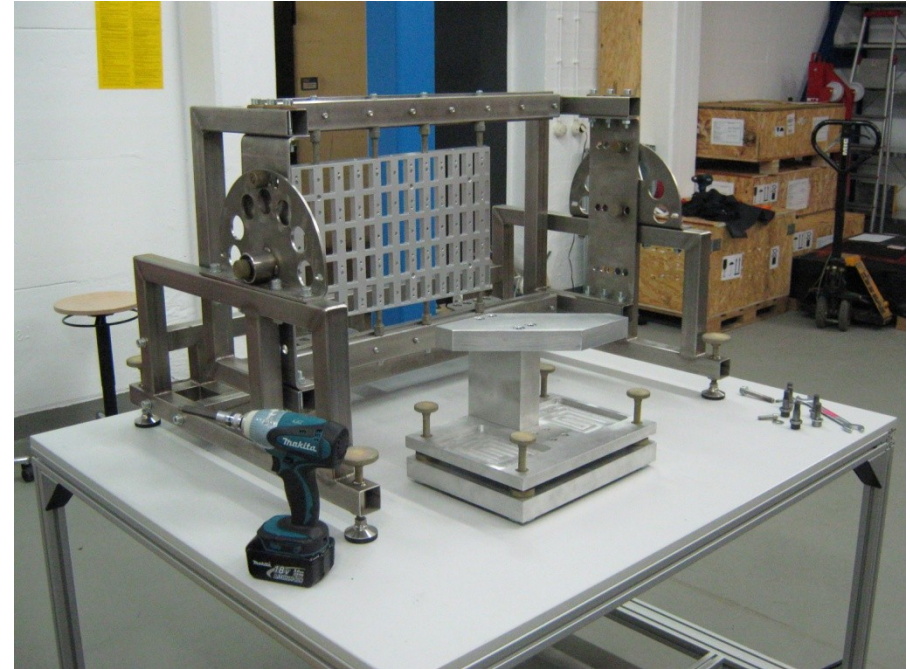
Module Assembly

Placement in 10x4 arrays

- Suspension frames (Alveoles) from carbon fiber composite material
- Fixation of xtals with front stoppers
- Placement of temp sensors between crystals



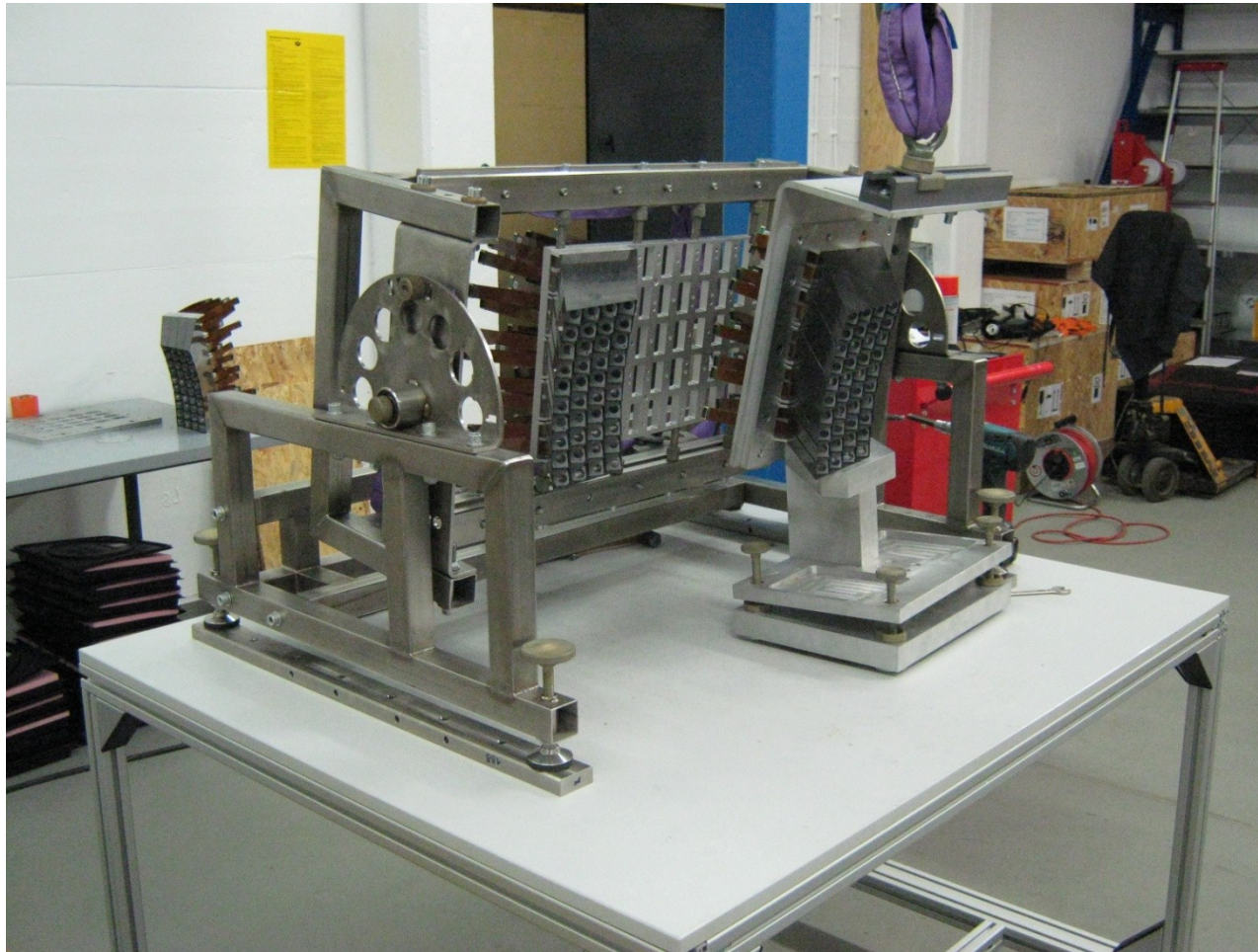
Slice Assembly



Slice Assembly



Slice Assembly



Slice Assembly



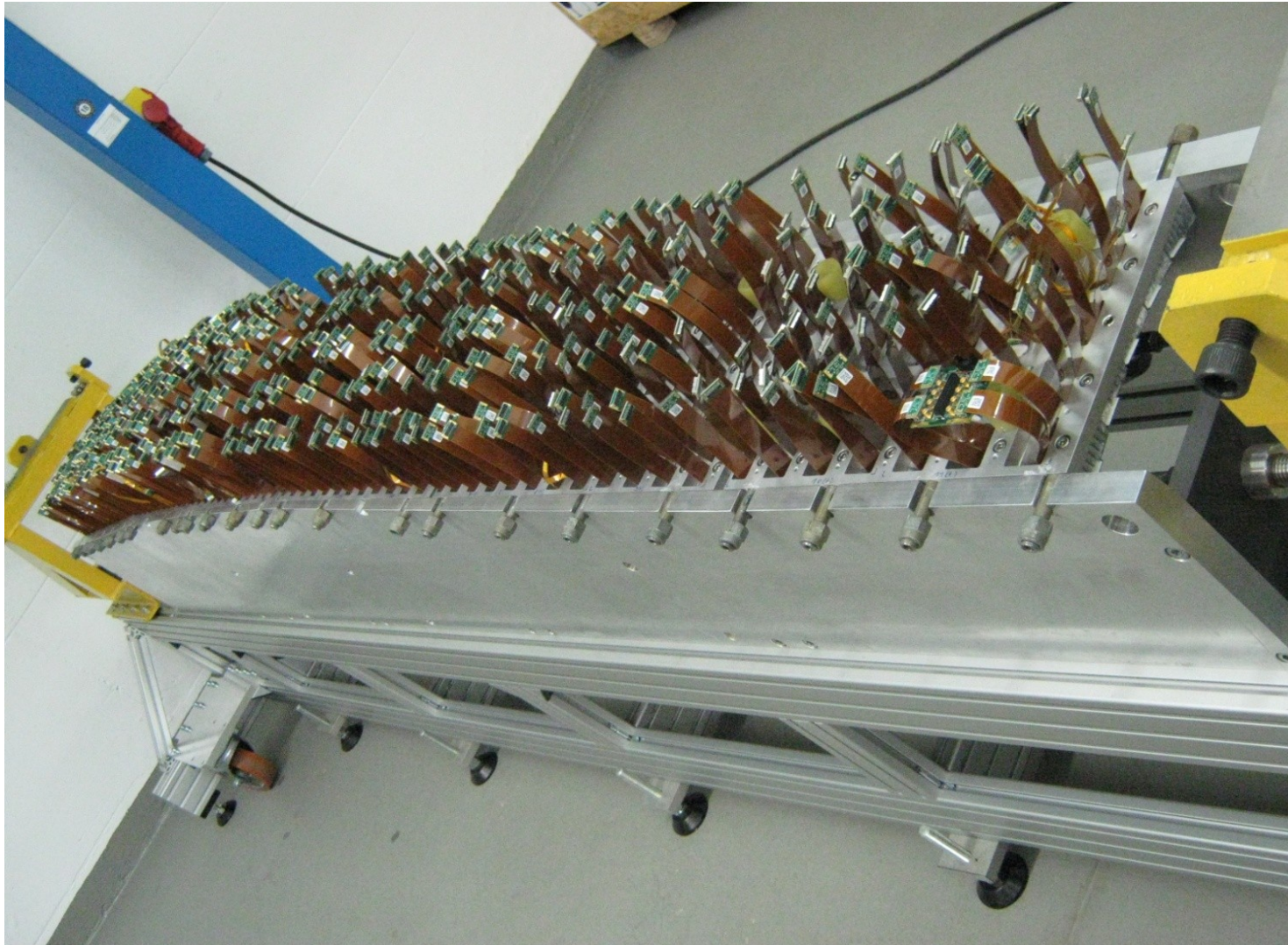
Slice Assembly



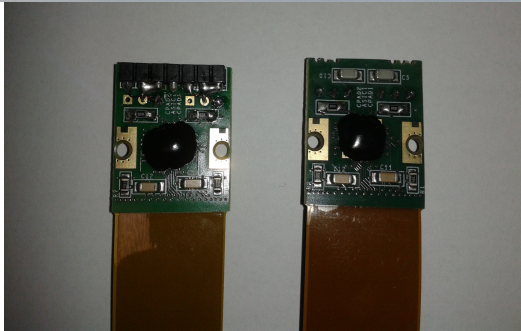
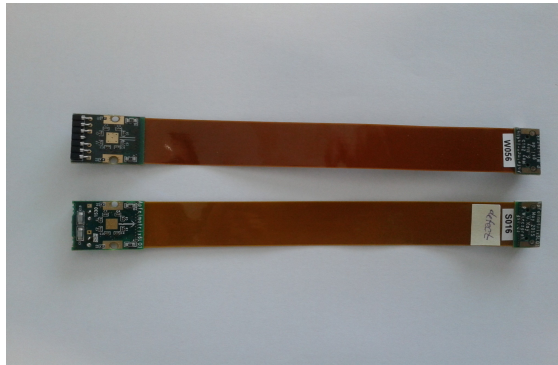
Slice Assembly



Slice Assembly

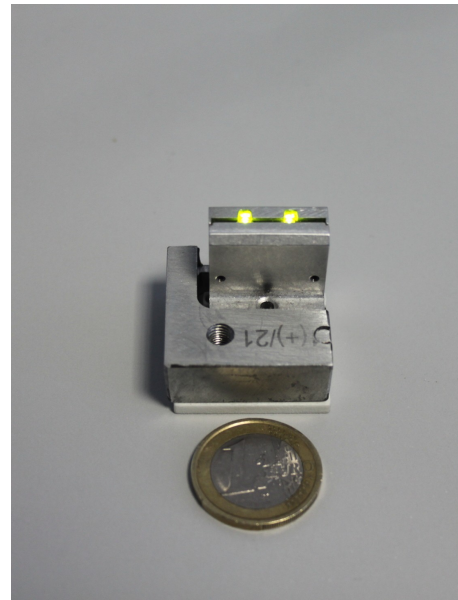


Frontend Modules

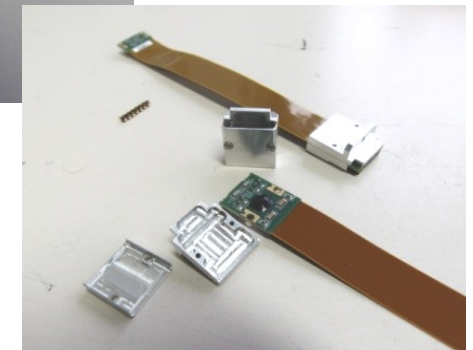
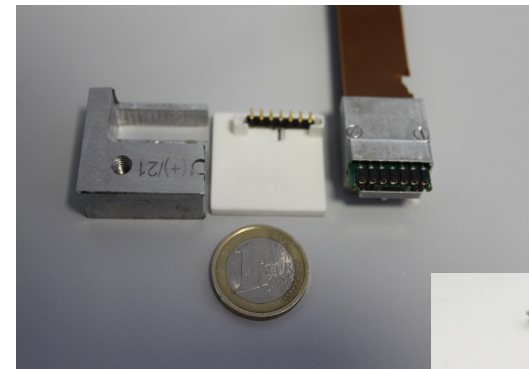


APFEL ASIC Flex PCB

- ~900 PCBs tested
- 107 failed tests: 82 ID, 14 baseline, 1 operating current



APD Test Adapter



Crystal Status

type	total	total+spare	L R		Left						Right						Missing		already financed		To be ordered	
					BTCP	PreProd	Proto60	SICCAS	CRYTUR	Tot	BTCP	PreProd	Proto60	SICCAS	CRYTUR	Tot	Left	Right	Left	Right	Left	Right
1	1280	1310	655	655	629	36				665	668	35				703	-10	-48			0	0
2	1280	1310	655	655	402	34				436	668	38				706	219	-51			219	0
3	1280	1310	655	655		40				40	628	37				665	615	-10			615	0
4	1280	1310	655	655		40				40		39				39	615	616			615	616
5	1280	1310	655	655		39			1	40		39			1	40	615	615			615	615
6	1280	1310	655	655		29	30			59		28	30			58	596	597			596	597
7	1280	1310	655	655		39			1	40		39			1	40	615	615			615	615
8	640	660	330	330		19			1	20		17			1	18	310	312			310	312
9	640	660	330	330	325	20				345	328	19				347	-15	-17			0	0
10	640	660	330	330	95	19		62	62	238	285	17				302	92	28	46		64	28
11	480	490	245	245		15					88	15				103	245	142	99		146	142
total	11360	11640			1451			62			2665				3		3897	2898			3795	2925
																						6720

Crystal Status

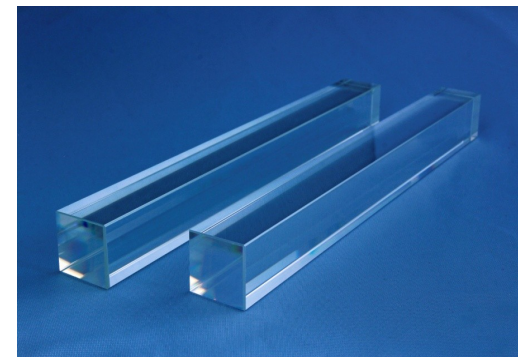
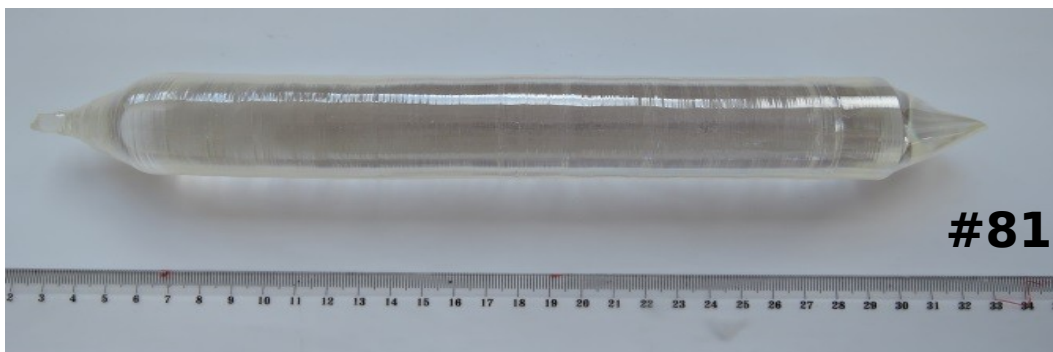


Next order of crystals @ Crytur

- 383 crystals
- ensures completion of next slice
- Combined effort from U Uppsala, HIM Mainz and CU Prague

Required Geometries:

- Type 3 : 40
- Type 4 : 82
- Type 5 : 82
- Type 6 : 54
- Type 7 : 82
- Type 8 : 42



Crystal Status

Transformation of crystal types by recutting/grinding

- Left/right crystals can not be transformed into each other
- Type 10 to 11
- Type 9 to 10 and 11
- 8 to 9
- 7 to 8
- All other transformations violate tolerances

