

# TEC - Module Carrier Plates

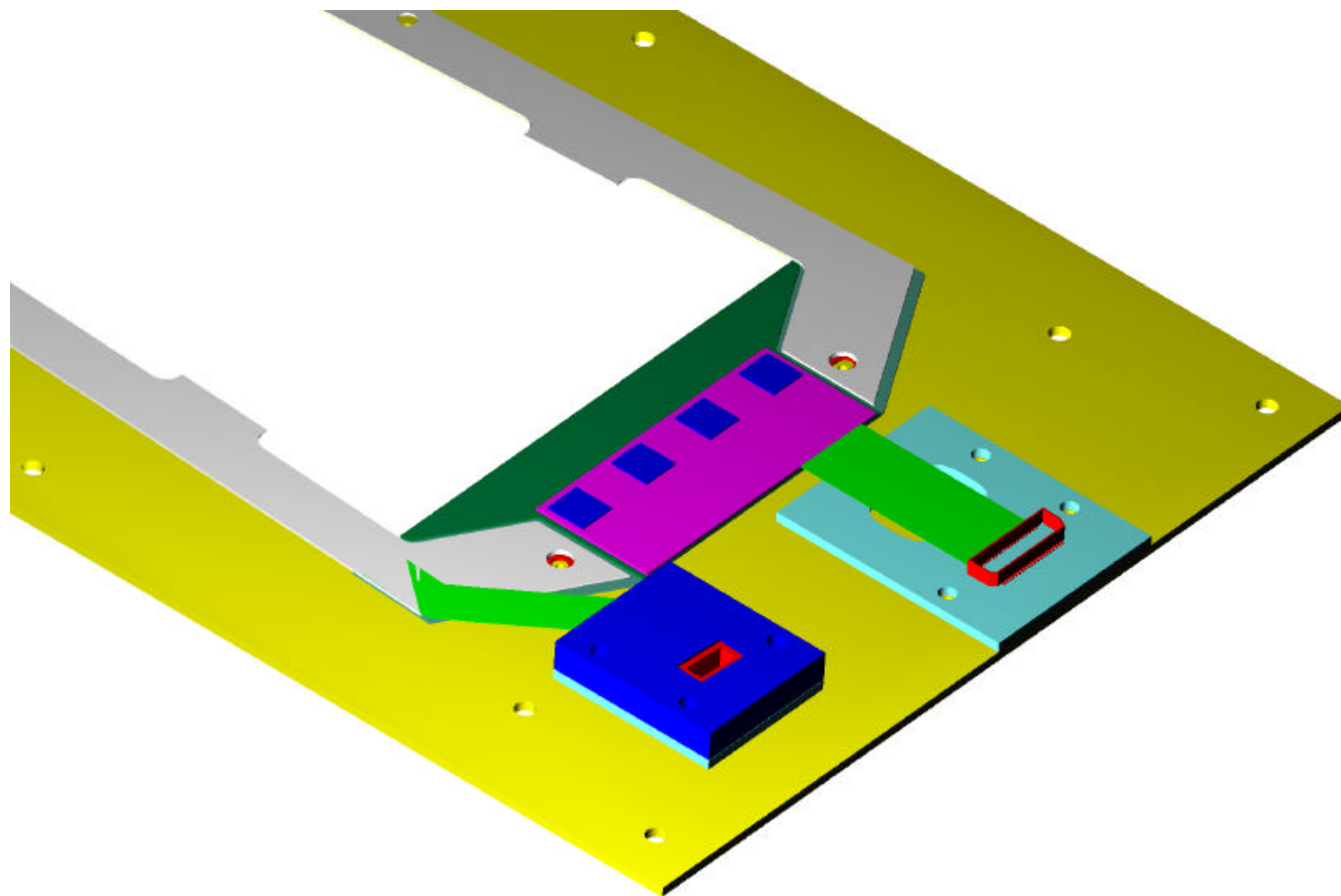
presented by H.J. Simonis  
Uni-Karlsruhe  
Tracker-Week, CERN, July-01

Function:

- " Enable the **riskless handling** of the delicate modules;
- " support for **transportation and storage**;
- " represent a **base-plate** in the various test-stations;
- " enable the CMS-like **cooling** of modules
- " conform with the **bonding** jig

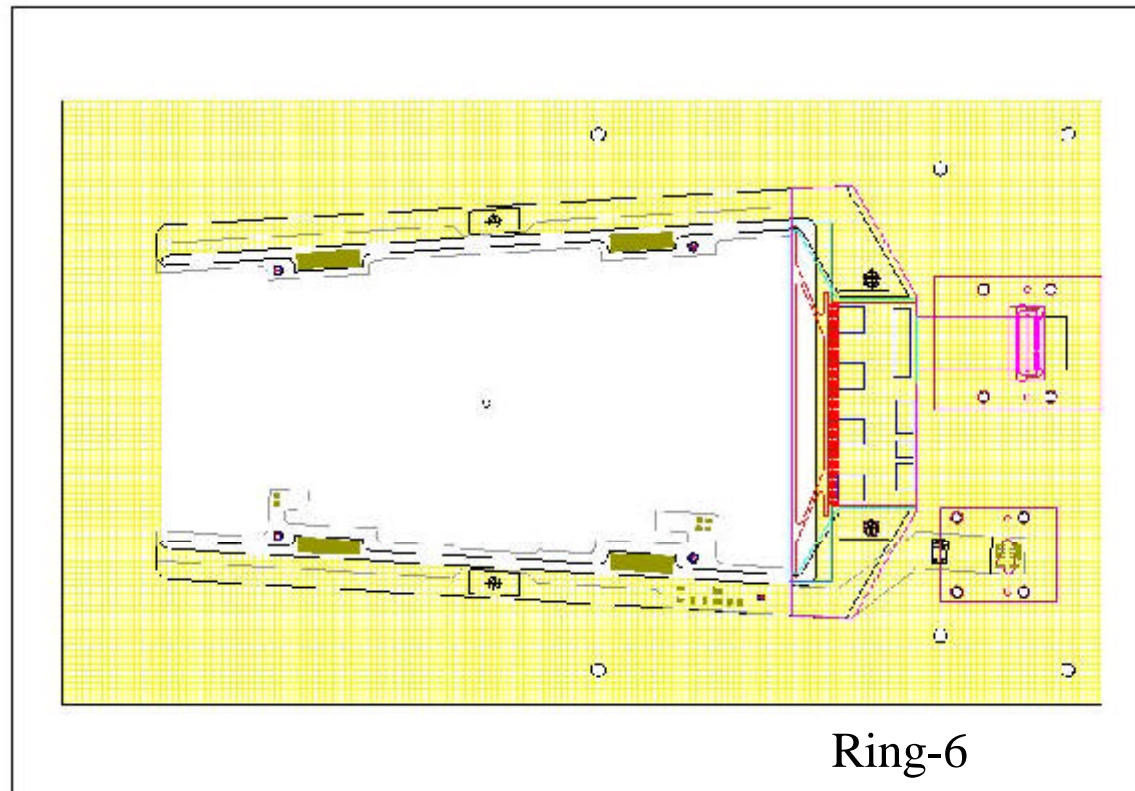
Intension: **standardized layout** for all carriers would simplify the handling in the various places where the modules have to be touched

3D-view of a Ring-6 module on the carrier:



Design – principle:

- " enable easily the „CMS-like“ **cooling** (mounting scheme)
- " avoid possible **discharges** from the sensor to the plate
- " **cheap** solution (TEC needs 4000-7000 pieces)
- " **protect the fragile capton-cable**
- " **fix the connectors**
- " **enable back-bond**



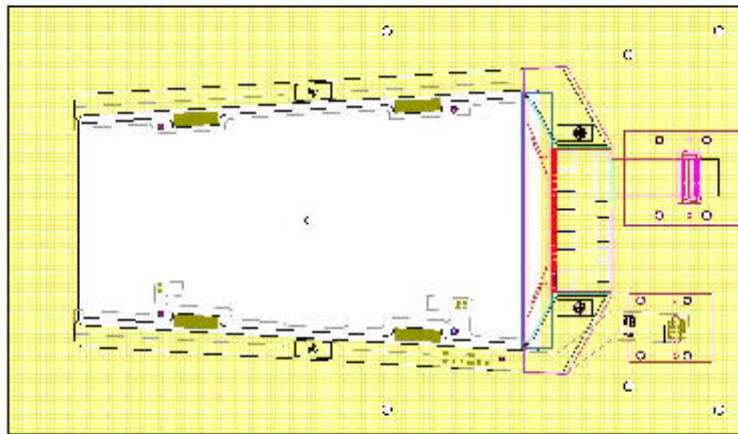
compromise:

TEC-plate does not fit to the **gantry** system (too big)

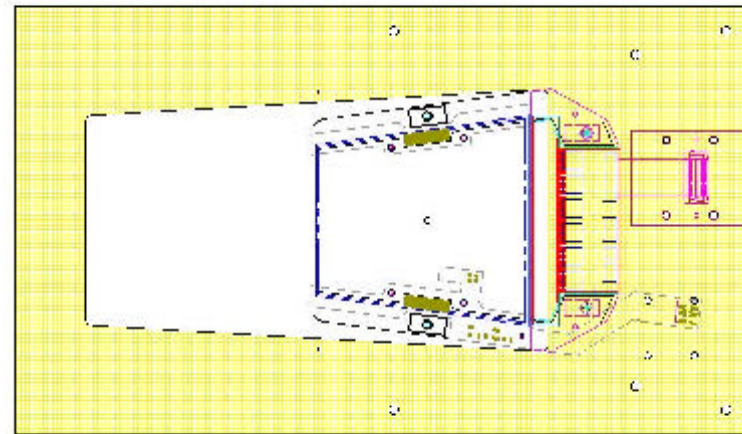
the plate remains attached to the sensor during **bonding**

Why can't we have the same module-carrier for all subdetectors:

->because the TEC alone needs already ten different designs!



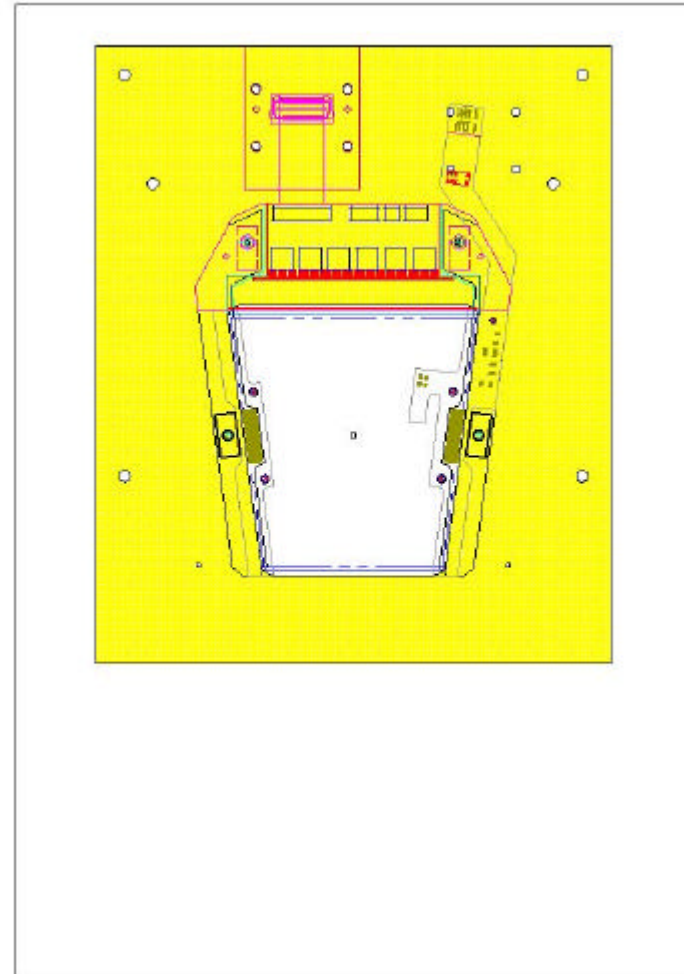
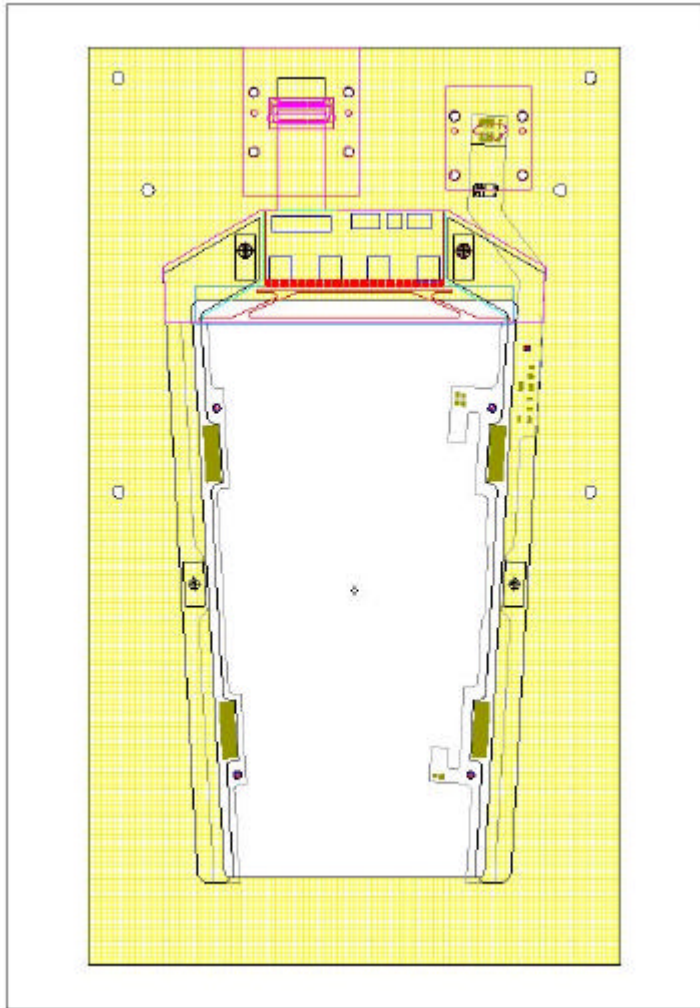
Ring-6



Ring-1

The **common parameters** for all plates are:

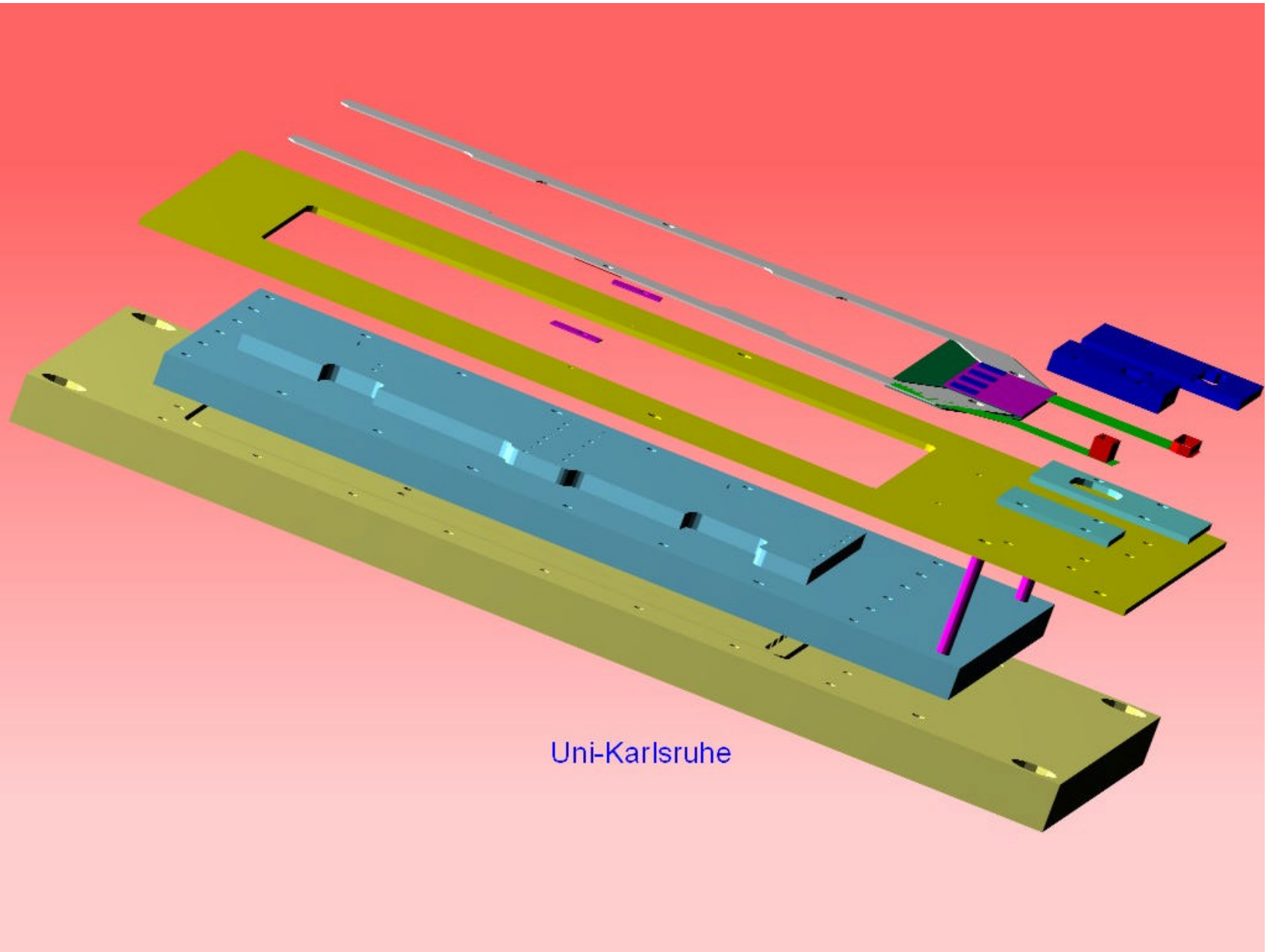
- " same width
- " same outer holes
- " same fiducial holes for the bond – jig
- " same NAIS-connector position (except for stereo)



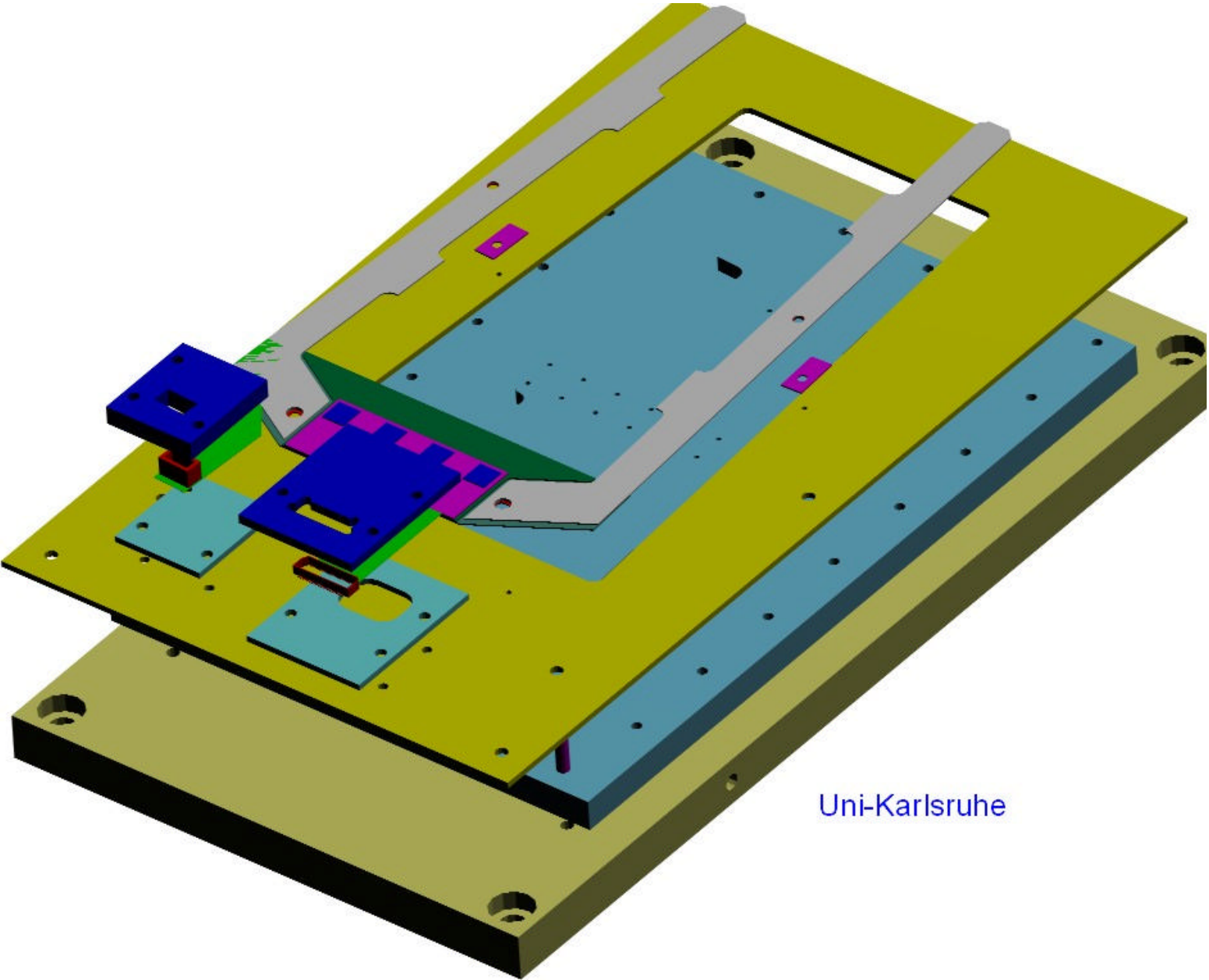
# List of parts needed to support one module:

- 1) 1 Alu-plate (2mm)
- 2) 2 distance-holders (alu, 0.5mm)
- 3) 4 special screws for the frame (1.6mm)
- 4) 4 plastic „screw-guides“
- 5) scotch tape (isolation at three points)
- 6) 1 NAIS-support (plastic, below)
- 7) 1 NAIS-fixation (plastic, top)
- 8) 1 SAMTEC-fixation (plastic)
- 9) 4 screws for the connectors (3mm)

- one set consist of about 20 parts;
- machining needs about 2 man-hours;
- total **cost** per set ~100sfr in this small series (M200)



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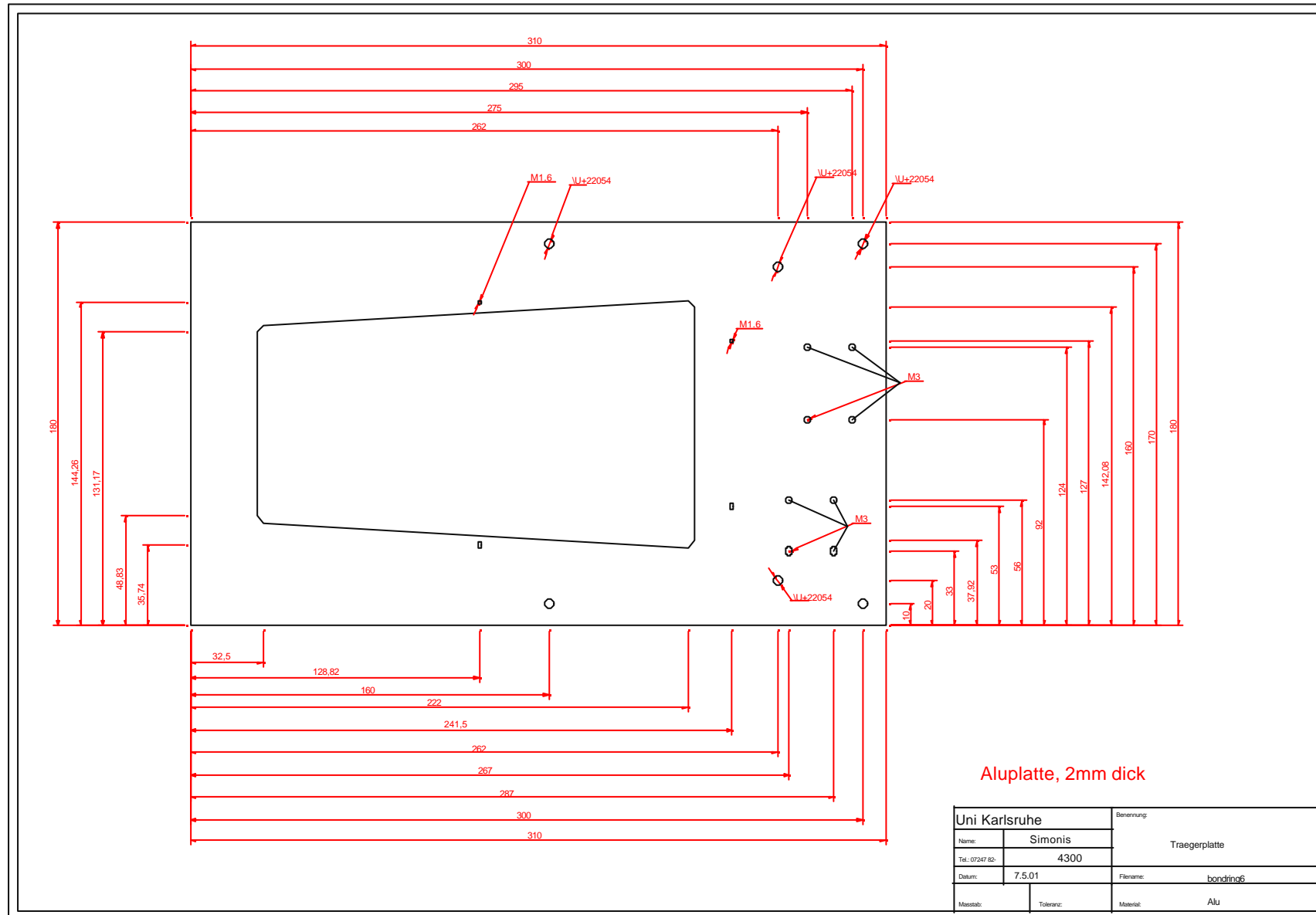
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# Dimensions of the M200 – TEC – Ring-6 Alu-carrier-plate

thickness: 2mm



Uni Karlsruhe		Benennung:
Name:	Simonis	Trägerplatte
Tel.: 07247 62:	4300	
Datum:	7.5.01	Filename: bonding6
Maßstab:	Toleranz:	Material: Alu

# Status mechanics:

## Karlsruhe responsibilities:

- All **carrier-plates** for TEC-M200 (80 sets)
- All **bonding-jigs** for TEC-Bonding-centers except for Wien (9 sets)

In view of the **tight schedule** and the complexity of the mechanics, the order for the full milestone-200 needs is in work (80 sets for TEC).

Two **bonding-jigs** are completely ready (one of them is in Aachen) plus two teflon plates (for Strasbourg an Zürich)

- 80 sets of **connector supports** and connector-fixations are ready
- about half of the **transport plates** are ready
- the special screws are already delivered

still missing:

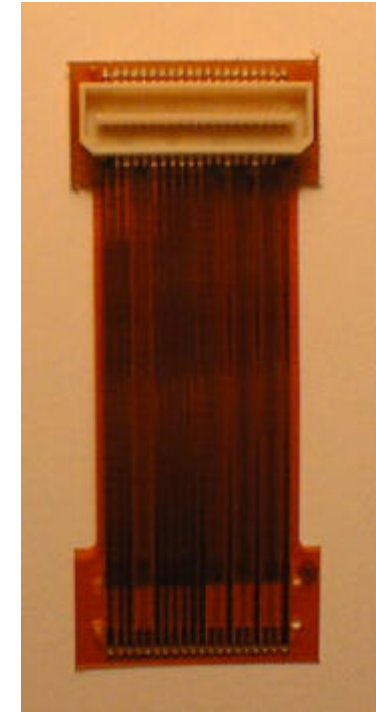
- alu distance holders
- plastic „screw-guides“

**Warning: Don't change the drawings**

# About the electrical connection between module and test-station

Prologue:

- 1) The **NAIS-connector** on the capton cable is only 50 times pluggable -
- 2) The number of standard-tests foreseen for every hybrid is high.



First approach:

equip every test-station with the complementary NAIS connector!

But:

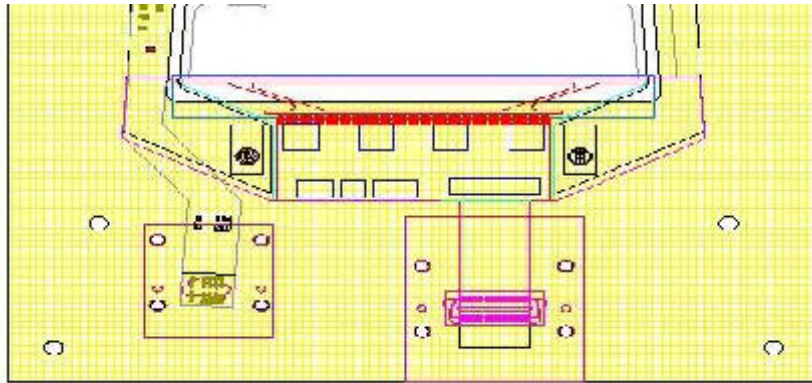
The load per test-station is in the order of 1000 modules.

So you have to **change the connector in the station** 20 times during the production-phase

second approach:

use a simple pcb-board, only equipped with two connectors.

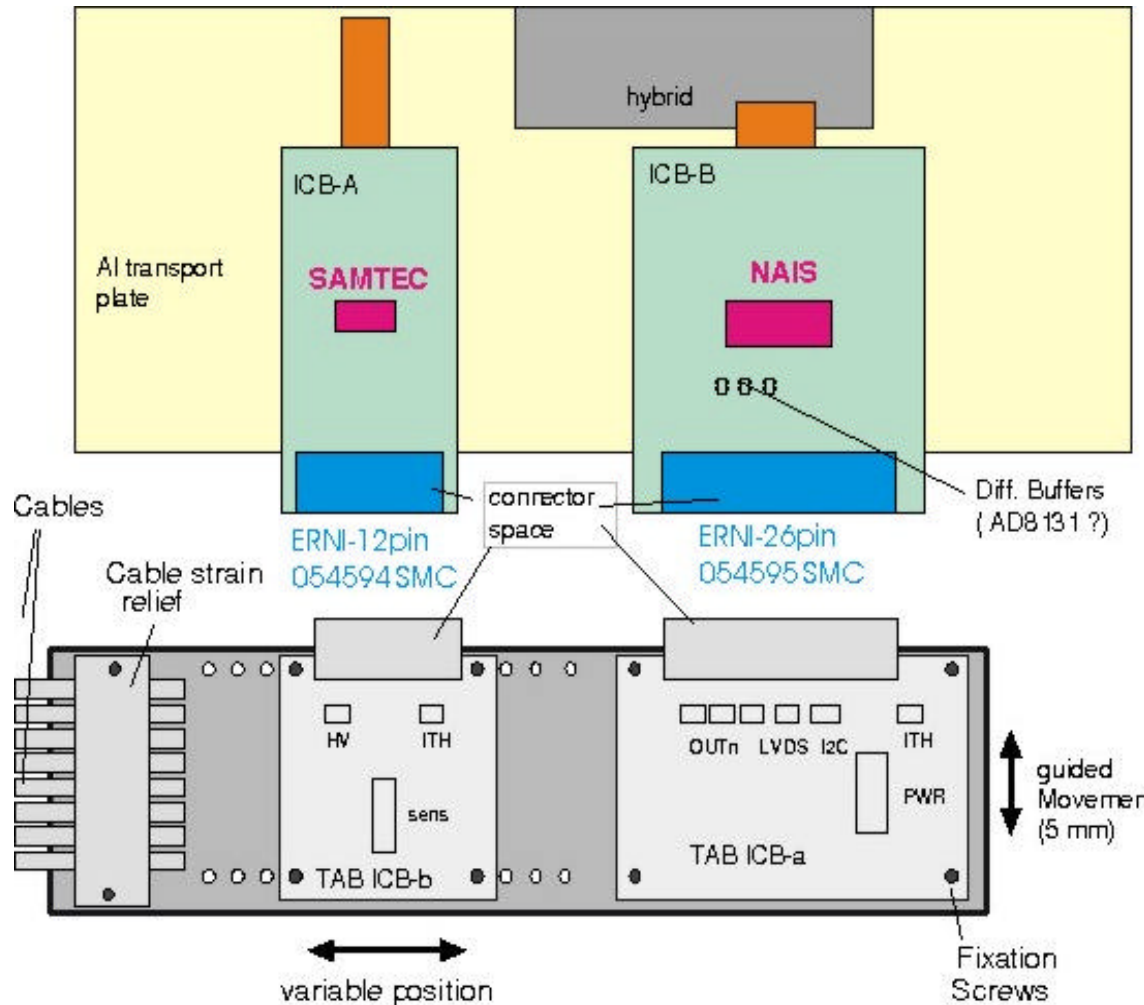
So from time to time you have to **throw away a 30 sfr-board**.



Problem:

1) We (TEC) need **two connectors**:  
APV-readout and sensor-bias

2) We have 10 different relative  
positions of the two connectors



3) The bias-connector  
is at an angle with  
respect to the front

4) connectors for the  
stereo-modules  
point downward

Siegfried's proposal:  
use a 26-pin ERNI connector.

Advantages:

- 1000-times pluggable
- reduced forces
- low cost (~2.50 sfr)

Need:

~300 pcb's (2 types)

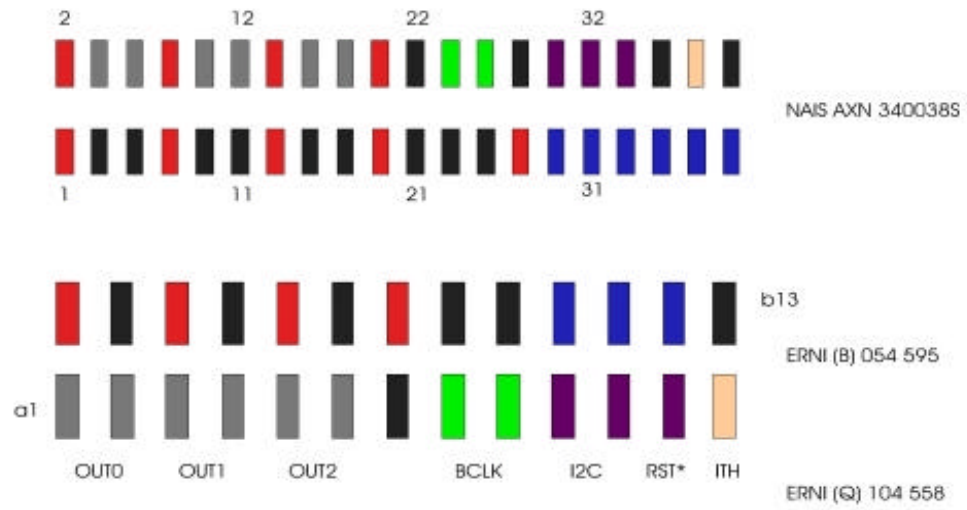
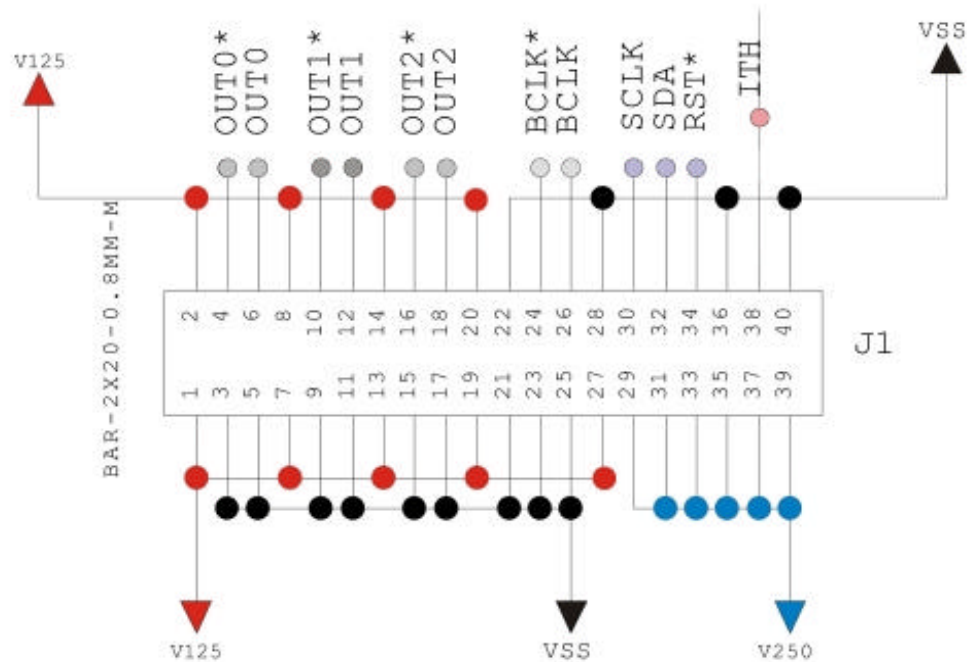
For bias:

use 12-pin ERNI

Need:

~300 pcb's (10 types)

Transform 40-pin-high-density (Nais) to 26-pin (Erni)



# Status interconnect:

We have ordered prototypes of the 4 relevant boards:

- 2 on the module-carrier
- 2 counterparts in the test-station

some ERNI-connectors are already in our lab

comment:

a unified solution is difficult:

we have no information about TIB (pin-assignment, type of connector)

open question:

Who will provide the NAIS and SAMTEC female connectors (Aachen or CERN)? (NAIS-batch is large and expensive)