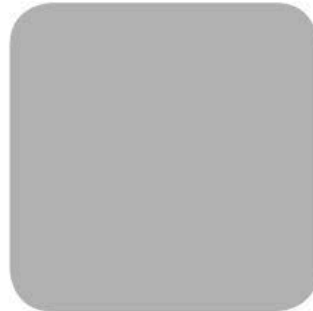




# **INSIGHT Pixel Detector**

Dr. Jens Weingarten  
on behalf of groups in Bonn, Dortmund, Siegen

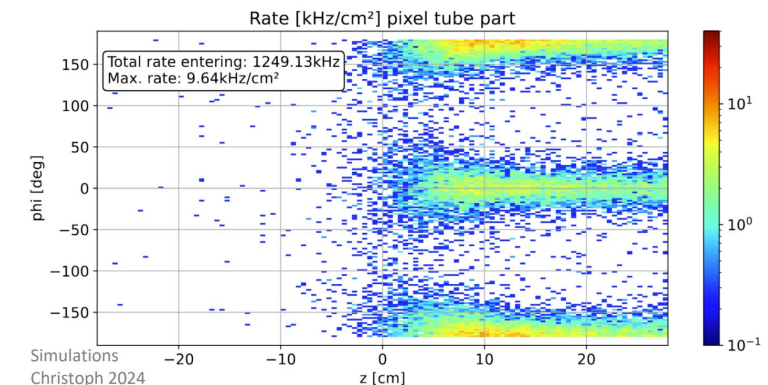
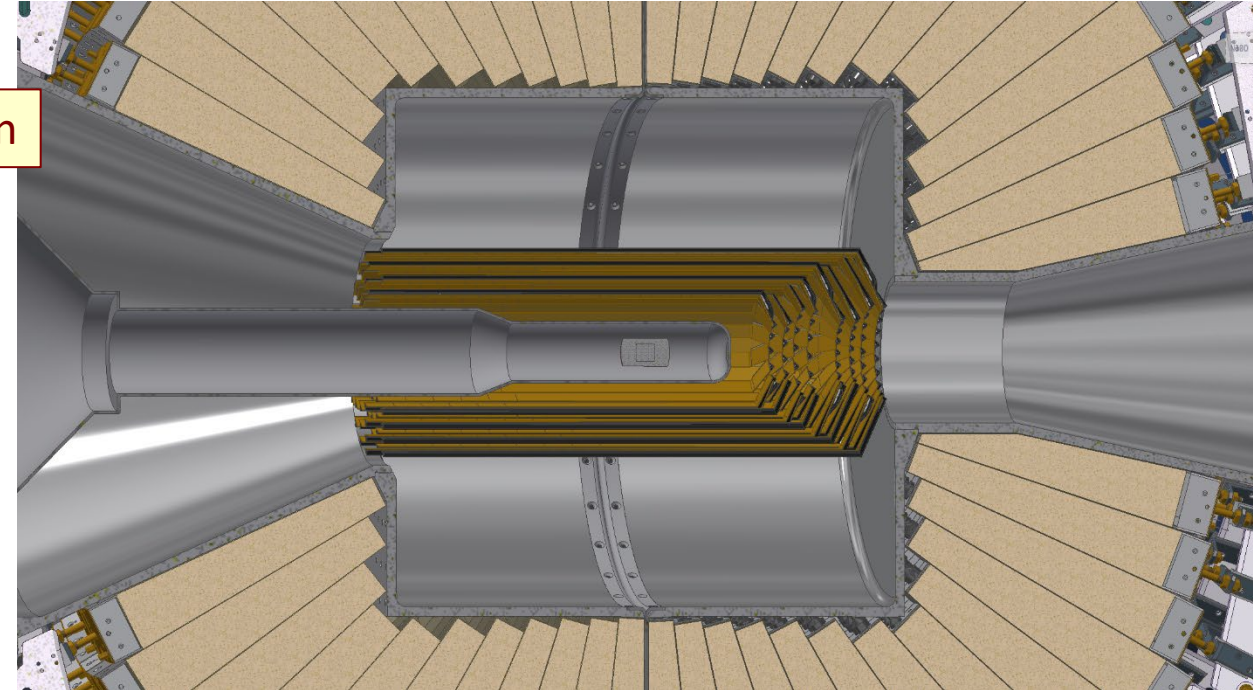


## Requirements

- 4 layers → maximize tracking efficiency
- Coverage in forward region  $\eta > 12^\circ$
- Minimal material → existing ID:  $3\% X_0$
- No scattering in forward region  
→ detector supported at one end only
- Hit rate up to 200kHz per chip, triggerless readout

1.4m<sup>2</sup> of silicon

Organization		
Subdetector Contact	Jens Weingarten	TUDo
WP Modules	Christian Bepin	Bonn
WP Services	tbd	Siegen
WP Mechanics	Mike Muschak, Tobias Bisanz	TUDo
WP Cooling	Mike Muschak, Tobias Bisanz	TUDo
WP DAQ	Jan Hartmann, Moritz Bieker	Bonn
WP Simulation	Tobias Seifen	Bonn



## Modules

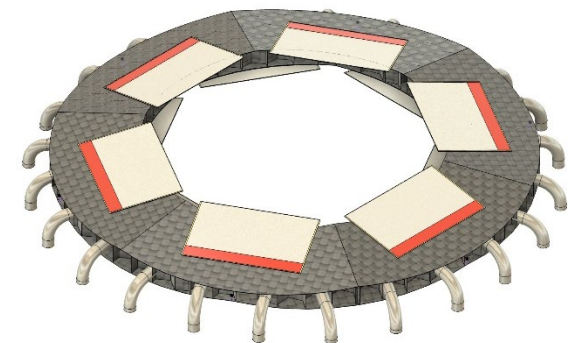
- Use OBELIX (Belle-II Upgrade DMAPS detector)
  - Access to chip design person power
  - Submission timeline tied to Belle-II  
→ Q1/26 (?)

## Cooling

- Water incompatible with CsI
- Operate above dew point
- Minimal material  
→ minimize power dissipation  
→ Stave materials

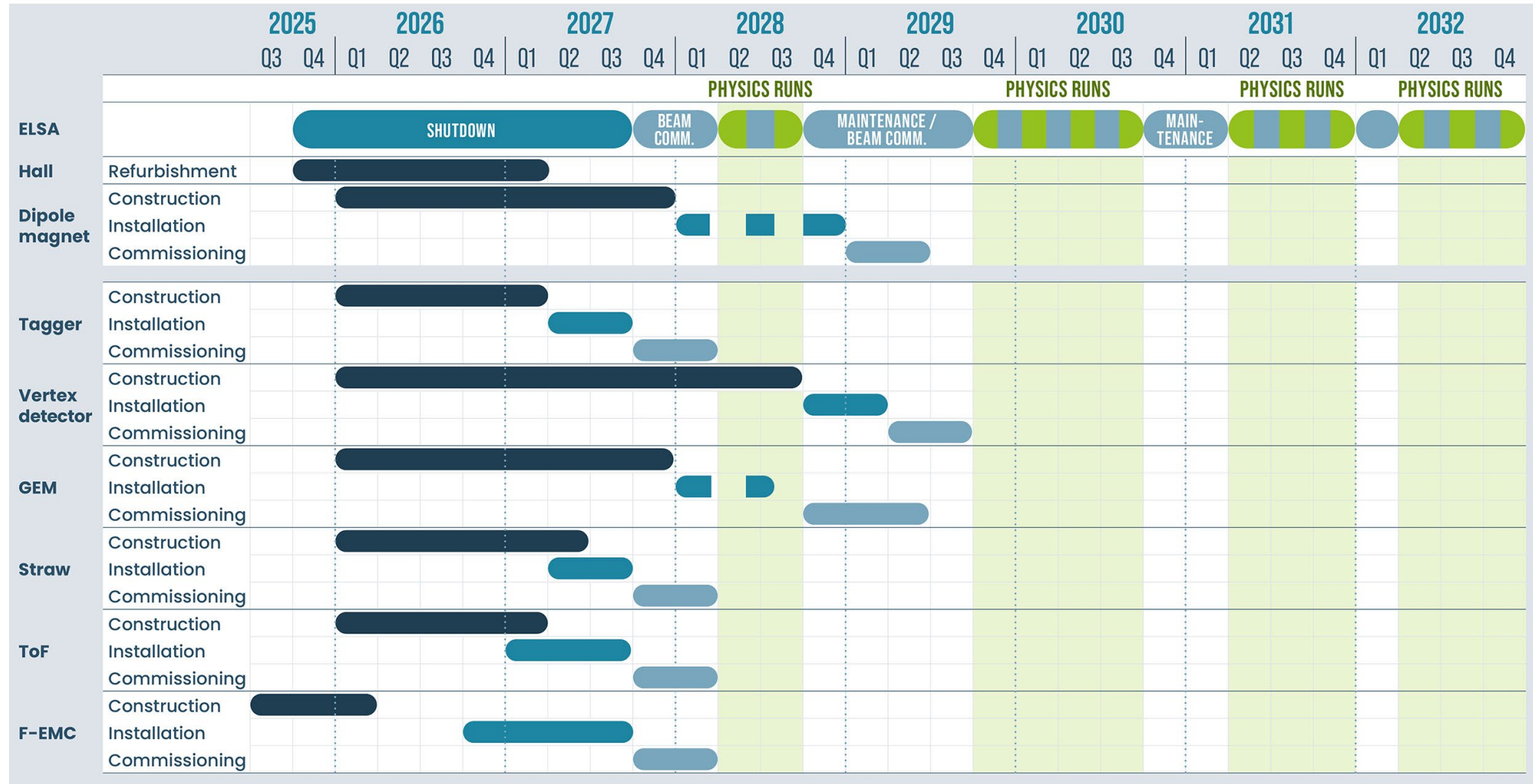
## Mechanics

- Current stave layout: 0.55%  $X_0$  (Si, carbon, Kapton/copper flex) + cooling pipes (0.25% titanium, 0.55% water)  
→ area average: 0.9%  $X_0$  per layer → Total: 3.8%  $X_0$
- Self-supporting staves: length between 22cm (L0) and 42cm (L3) plus inclined part (up to 12cm)
  - Materials, Geometry? → Simulation (with help from dept. Baumechanik TUDo and Purdue university)
- Bent staves generate problems → re-opening global design considerations  
→ investigating feasibility of a disk layout





## TIMELINE FOR INSIGHT @ ELSA



Pixel Detector	2026	2027	2028	2029	...
Sensors	50	180	180	0	0
Mechanics, Infrastructure	50	100	100	0	0
<b>Total</b>	<b>100</b>	<b>280</b>	<b>280</b>	<b>0</b>	<b>0</b>

Budget in k€ according to proposal

A wide-angle photograph of the TU Dortmund main building, a large modern structure with a glass facade and a green 'tu' logo on the roof. In the foreground, there is a paved plaza with several large, leafy green trees. People are seen walking and sitting on the grass under the trees. The sky is blue with some light clouds.

Thank you for your attention