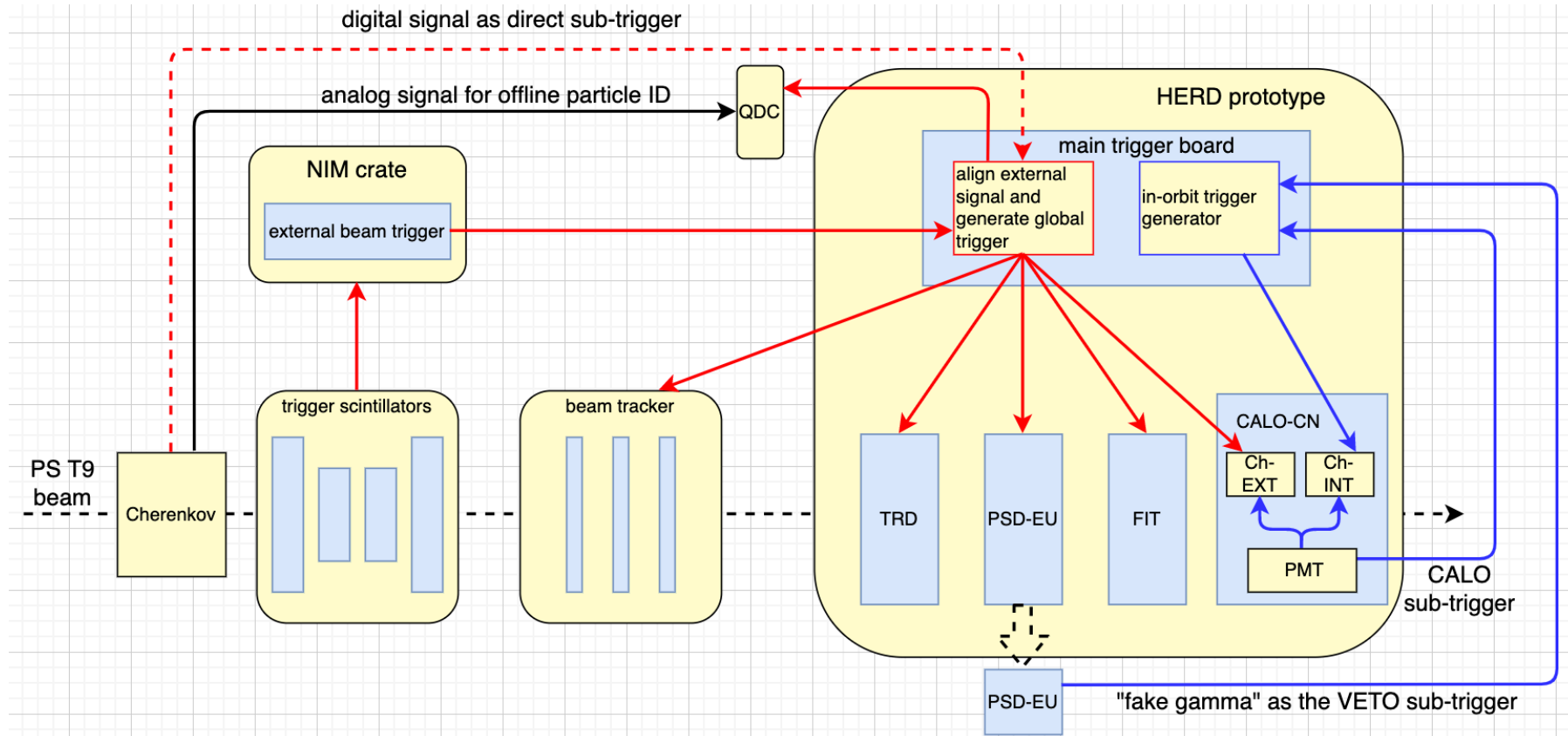


Layout and trigger proposal for PS activities



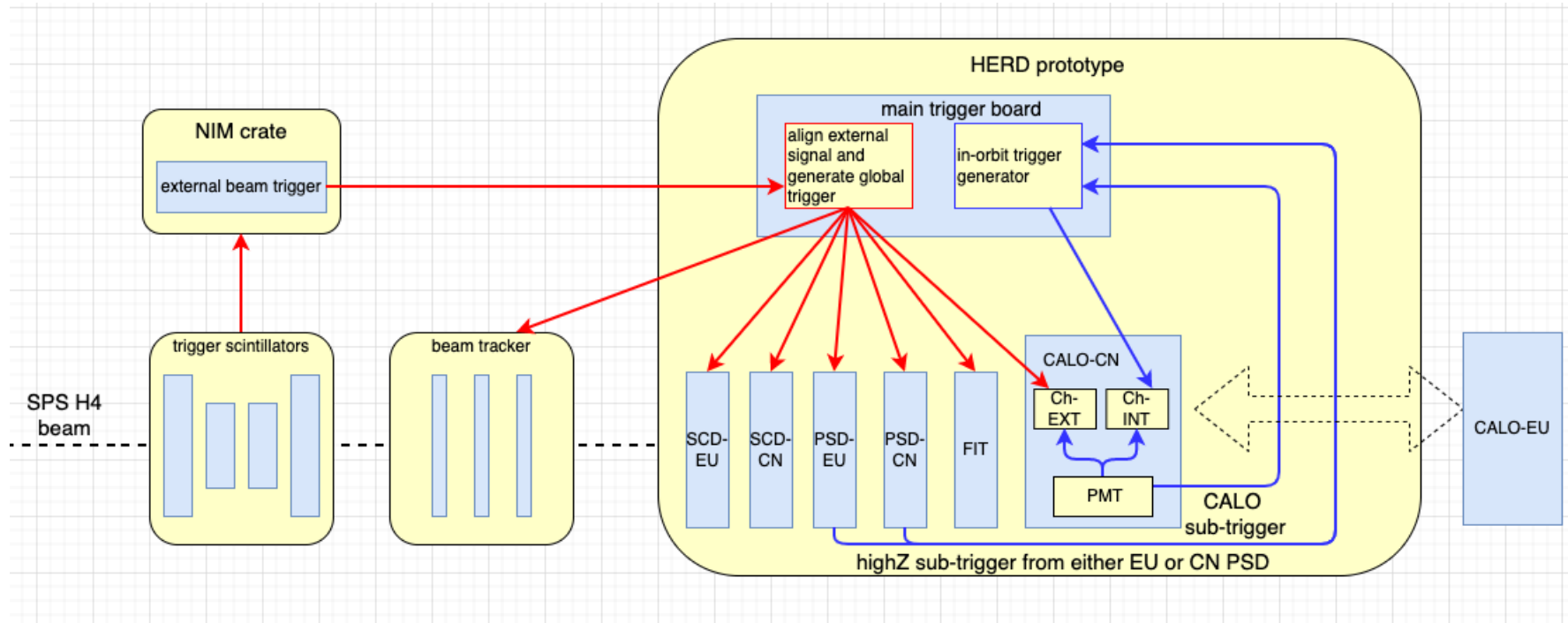
- ▶ analog Cherenkov and a ‘user-defined’ QDC for offline particle separation.
- ▶ two trigger scheme as the global beam trigger and in-orbit trigger.
- ▶ PSD detector will partially be moved “off” from the beam line, where the electron beam could be used as “fake gamma” to validate the in-orbit LEG trigger performance, especially the latency and timing fluctuations.

geometry and scanning requirements

	envelope parameters(m m)	gap to downstream devices	scanning requirements horizontal	scanning requirements vertical	rotation requirements	additional notes
TRD	250*250*250	free para.	± 15 cm stage, 1cm step	± 15 cm stage, 1cm step	± 30 deg. stage, 1 deg step	a XSCA table from CERN-EN?
PSD- EU	TBC	free para.	TBD	TBD	TBD	TBD
FIT	TBC	free para.	TBD	TBD	TBD	TBD
CAL O-CN	3*3*3 LYSO array, envelope TBC	*	not required	not required	not required	trigger system will be combined with Crystal array. A fixed table will be OK to align the CALO geometry center with beam.

beam requirements and test purpose						
step	beam particle	momentum (GeV/c)	beam spot(cm)	intensity	statistics	purpose
1 pure e- mode	e-	1, 0.5, 2, 3, 4, 6, 10	< 2*2	trigger rate < 270Hz	TRD: a). >=40k, for each of the 5 energy point <= 4GeV/c; b). >=20k, for each of the 2 energy point > 4GeV/c	1. energy scanning for TRD, the priority energies; 2. threshold calibration for CALO PM trigger 3. UNB trigger performance 4. LEG logic test by moving PSD off from beam line, where the PSD signal could be equalized as "Veto"
2 pure e- mode	e-	1.5, 2.5, 8	< 2*2	trigger rate < 270Hz	TRD: a). >=40k, for each of the 2 energy point <= 4GeV/c; b). >=20k, for each of the 1 energy point > 4GeV/c	1. energy scanning for TRD, the secondary energies; 2. UNB trigger performance 3. LEG logic test by moving PSD off from beam line, where the PSD signal could be equalized as "Veto"
3 hadron mode	pion-	10, 15	< 2*2	trigger rate < 270Hz	TRD: >=20k, for each of the 2 energy point	1. hadron response of TRD
4 pure e- mode	e-	3	< 2*2	trigger rate < 270Hz	TRD: >=20k, for each of the 5 TRD scanning point	1. uniformity study of TRD with 5 scanning point;

Layout and trigger proposal for SPS Ion activities



- ▶ no Cherenkov, and some more instruments as SCD, PSD-CN(bar configuration), and CALO-EU
- ▶ two trigger scheme same as PS configuration.
- ▶ either PSD-EU or PSD-CN could participant in the in-orbit highZ trigger validation.

geometry layout and scanning requirements						
	envelope parameters(cm)	gap to downstream devices	scanning requirements horizontal	scanning requirements vertical	rotation requirements	additional notes
SCD-CN	4*module, IHEP(2), PMO(2) 30*10*3, each of IHEP; 82*10*3, each of PMO	free para.	not required	± 5 cm stage, 1cm step	0, 60, 45, 30 degree, vertical direction to the strip; 50 degree, horizontal direction to the strip	
SCD-EU	TBD	free para.	TBD	TBD	TBD	
PSD-CN	2*bar module, 140*10*2, each	free para.	50cm stage, 1cm step	± 5 cm stage, 0.5cm step	not required	
PSD-EU	TBD	free para.	TBD	TBD	TBD	
FIT	TBD	free para.	TBD	TBD	TBD	
CAO-CN	TBC	*	not required	not required	not required	
CALO-EU	TBD	*	TBD	TBD	not required	

beam requirements and test purpose					
instrument	beam particle	beam spot(cm)	intensity	statistics	purpose
PSD-CN	Z from 2 to 26, the higher Z the higher priority	not required, spread beam is preferred	trigger rate < 250Hz	$\geq 50k$, for each of the Z components, for each of the scanning point	1. charge Z performance study 2. dynamic range, linearity study.
SCD-CN	Z from 2 to 28, the higher Z the higher priority	not required, spread beam is preferred	trigger rate $\leq 200Hz$	$\geq 40k$, for each of the Z components, for each of the scanning point	1. charge Z performance study 2. dynamic range, linearity study.
PSD-EU	TBD	TBD	TBD	TBD	TBD
SCD-EU	TBD	TBD	TBD	TBD	TBD
CALO-CN	TBD	$< 2*2$	trigger rate < 300Hz	TBD	1. highZ trigger logic validation
CALO-EU	TBD	TBD	TBD	TBD	TBD