



SHiP

Search for Hidden Particles

**SHiP combined test beam
13 September – 2 October**



Devices under tests



○ Straw Tracker:

- 2 m long / 20 mm diameter, 30 μm wire
- Tracking telescope: 8 Si sensors, about 94 mm x 92 mm provided by Nicola Neri (LHCb Milano group)

○ CALO (TP option):

- HCAL prototype (a spare module of LHCb HCAL) in vertical position, beam points to its side 16x1.2 λ longitudinal segmentation
- ECAL prototypes (Shashlik, 3 different versions)
- infrastructure (beam scintillators, tracker, DAQ) shared with SST

○ Surround Background Tagger Liquid Scintillator option

- Liquid scintillator module, linear alkylbenzene (LAB)
- Plastic scintillator trigger system

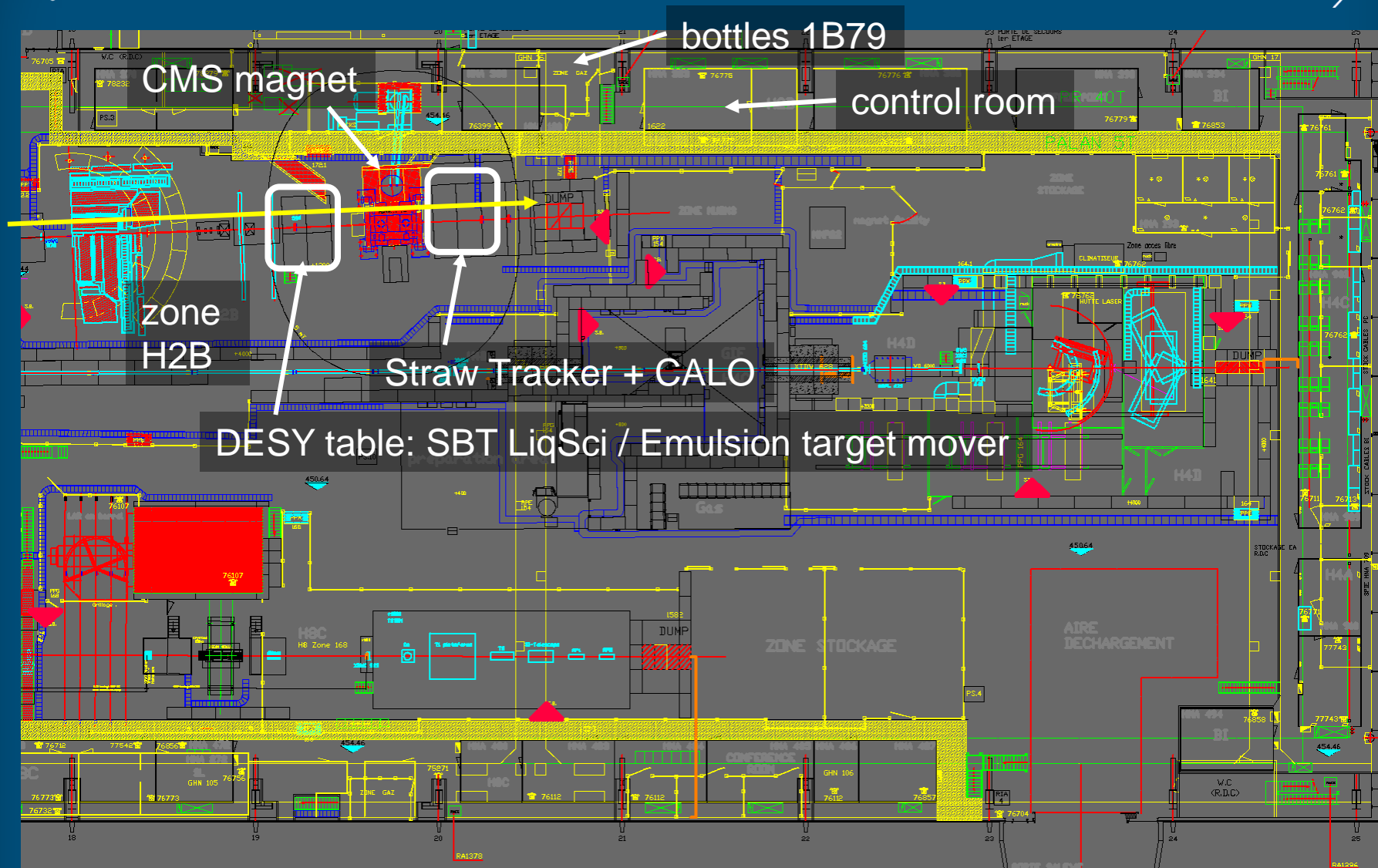
○ Emulsion for charm production measurement in long target

- Emulsion mover
- Emulsion + silicon pixel tracker from Bonn



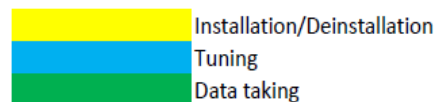


SHiP combined test beam in H2





Plan



Date		Shift	Beam	Particle	Energy	Size	Rate	Straw tracker	Calorimeter	SBT-LiqSc	Emulsion	CMS HGAL
13-Sep	Wednesday	00:00 - 08:00								Setup trigger		
		08:00 - 16:00								scintillator		
		16:00 - 24:00		Muons	150 GeV	10cm	10 kHz					
14-Sep	Thursday	00:00 - 08:00										
		08:00 - 16:00										
		16:00 - 24:00		Hadrons	150 GeV	1cm	10 kHz					
15-Sep	Friday	00:00 - 08:00										
		08:00 - 16:00										
		16:00 - 24:00										
16-Sep	Saturday	00:00 - 08:00										
		08:00 - 16:00										
		16:00 - 24:00										
17-Sep	Sunday	00:00 - 08:00										
		08:00 - 16:00										
		16:00 - 24:00		Hadrons	20-60 GeV	5cm	O(100) Hz					
18-Sep	Monday	00:00 - 08:00										
		08:00 - 16:00	08:00									
		16:00 - 24:00										
19-Sep	Tuesday	00:00 - 08:00										
		08:00 - 16:00										
		16:00 - 24:00	No beam									
20-Sep	Wednesday	00:00 - 08:00										
		08:00 - 16:00										
		16:00 - 24:00										
21-Sep	Thursday	00:00 - 08:00										
		08:00 - 16:00										
		16:00 - 24:00	20:00	Electrons	50-100 GeV	cm-few cm	O(100) Hz					



Plan



Date	Shift	Beam	Particle	Energy	Size	Rate	Straw tracker	Calorimeter	SBT-LiqSc	Emulsion	CMS HGCAL				
22-Sep Friday	00:00 - 08:00	Green						Green							
	08:00 - 16:00														
	16:00 - 24:00														
23-Sep Saturday	00:00 - 08:00														
	08:00 - 16:00														
	16:00 - 24:00														
24-Sep Sunday	00:00 - 08:00														
	08:00 - 16:00											Hadrons	20-60 GeV	5cm	O(100) Hz
	16:00 - 24:00														
25-Sep Monday	00:00 - 08:00														
	08:00 - 16:00											Muons	20-60 GeV	10cm	O(100) Hz
	16:00 - 24:00														
26-Sep Tuesday	00:00 - 08:00														
	08:00 - 16:00											Electrons	50-100 GeV	cm-few cm	O(100) Hz
	16:00 - 24:00														
27-Sep Wednesday	00:00 - 08:00														
	08:00 - 16:00	MD 08:00	Protons	350 GeV	0.5cm	1 - 2 kHz									
	16:00 - 24:00	18:00													
00:00 - 08:00															
28-Sep Thursday	08:00 - 16:00	Green								Blue					
	08:00 - 16:00														
	16:00 - 24:00														
29-Sep Friday	00:00 - 08:00														
	08:00 - 16:00														
	16:00 - 24:00														
30-Sep Saturday	00:00 - 08:00														
	08:00 - 16:00											Electrons/ Hadrons	20-300		O(100) - kHz
	16:00 - 24:00														
01-Oct Sunday	00:00 - 08:00														
	08:00 - 16:00														
	16:00 - 24:00														
02-Oct Monday	00:00 - 08:00														
	08:00 - 16:00														
	16:00 - 24:00														



Beam requirements



- Muons: 150 GeV, 10 cm (unavoidable), 10 kHz
- Muons: 20-40-60 GeV, 10 cm (unavoidable), 100 - few 100 Hz (limited)
- Hadrons: 150 GeV, 1 cm, 10 kHz
- Hadrons: 20-40-60 GeV, 5 cm, 100 - few 100 Hz (limited)
- Electrons: 50-75-100 GeV, few cm, 100 - few 100 Hz (limited, purity 80%)
- Protons: 350 GeV, 0.5cm, 1 kHz (10% muon contamination)
- HGICAL: electrons and hadrons (positive or negative), 20 - 300 GeV



- ISIECs:

- Straw Tracker, CALO, SBT submitted
- Emulsion target mover coming

- Safety inspection

- Straw Tracker 13 September, 16:00
- SBT: 21 September, 16:00
- Emulsion target mover: tentatively 27 September, 16:00