

GSI in Program-Oriented Funding 2028-2034 (PoF-5)

Future CBM

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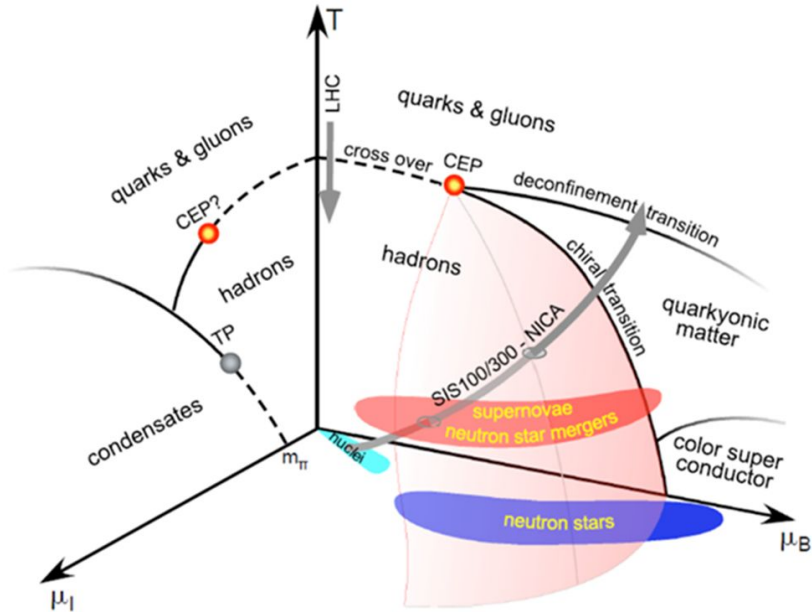
CML Retreat 2023

Hotel zum Löwen (Mörfelden-Walldorf)
2023.10.04

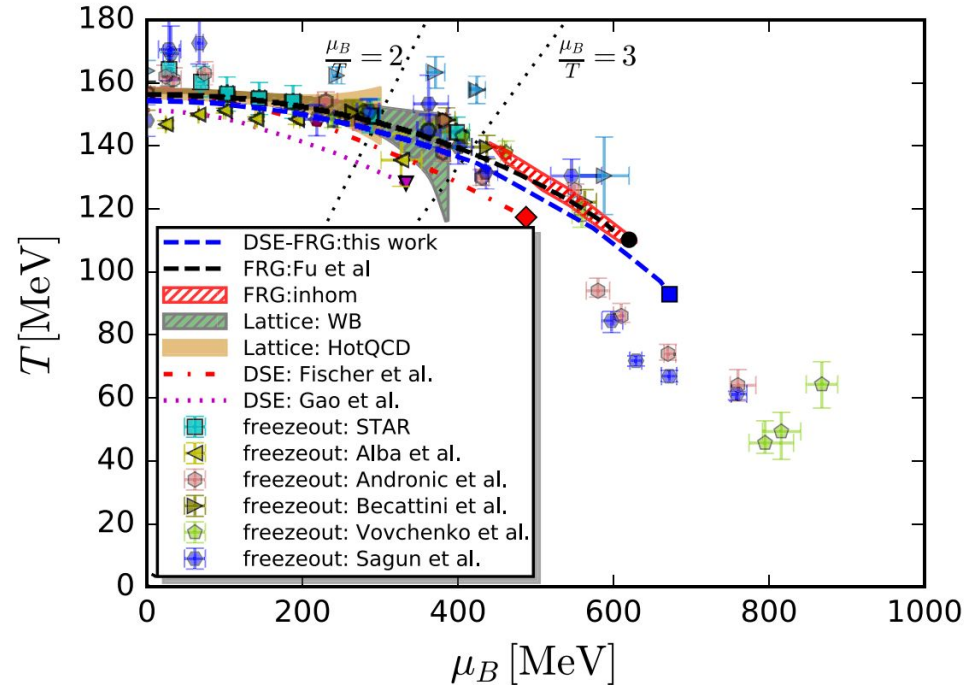


QCD phase diagram and its structures at high μ_B

NUPECC Long Range Plan 2017

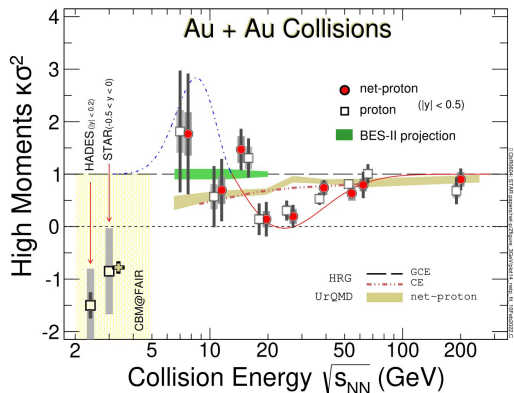


W. j. Fu, J.M.Pawlowski & F.Rennecke, PRD101 (2020) 5, 054032

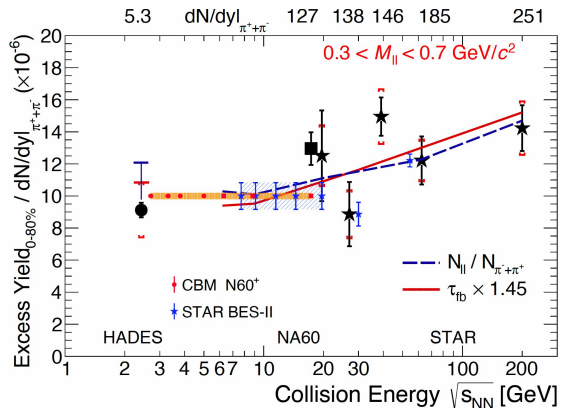


CBM science: physics observables

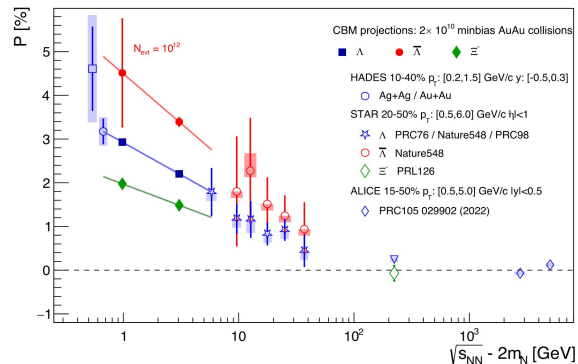
Cumulants of conserved quantities



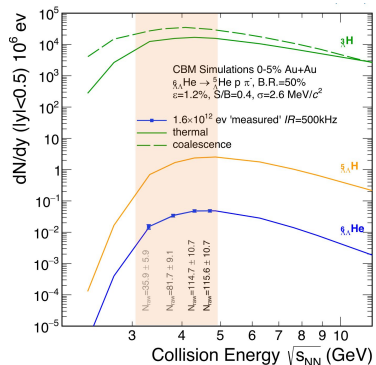
Di-lepton excess radiation



Multi-strange hyperons: collective and polarisation phenomena



Hypernuclei



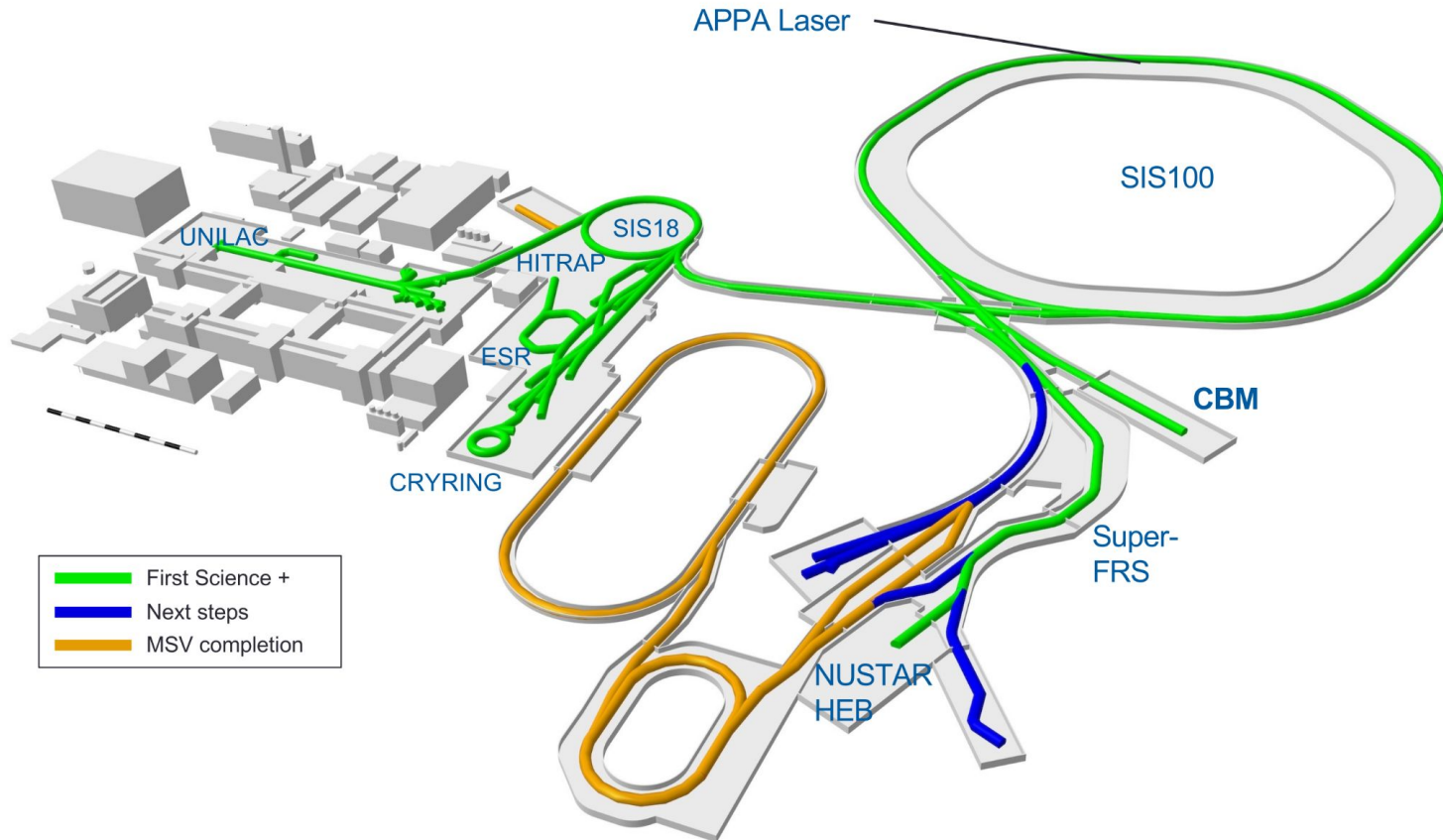
+ Sub-threshold charm production

+ Proton induced reaction (see talk by Jim Ritman)

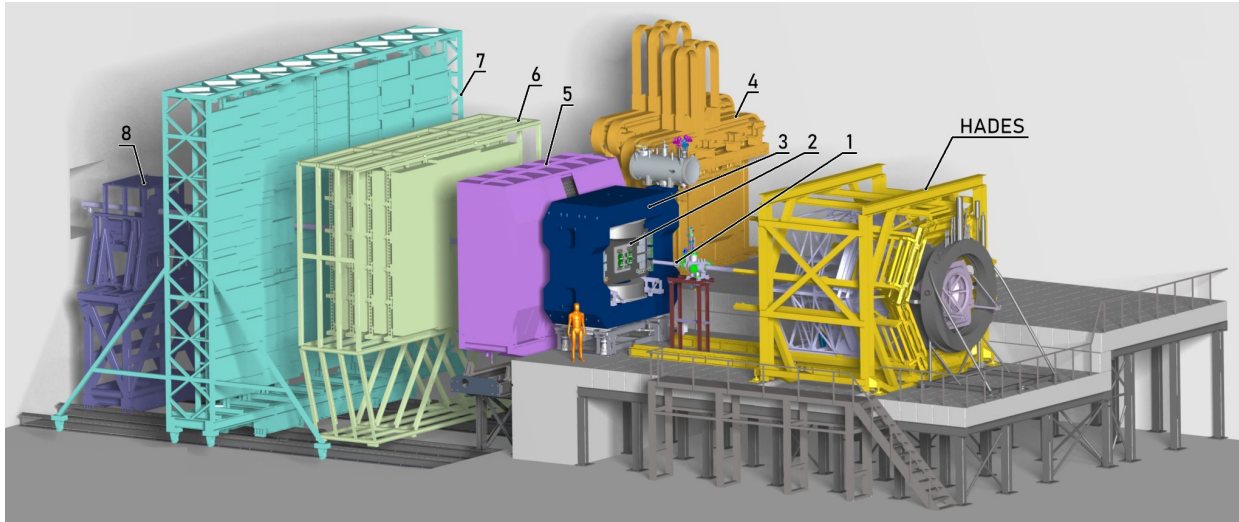
First CBM science: running scenarios for the first 3 years

Year	Setup	Reaction	Beam Energies T_{lab} [AGeV]	Days on Target	Number of events	Remarks
0	ELEHAD	C+C, Ag+Ag, Au+Au	2,4,6,8,10,max	60		Commissioning
1	ELEHAD	Au+Au	2,4,6,8,10,max	30 (5 each)	$2 \cdot 10^{10}$ each	EB minBias
1	ELEHAD	C+C	2,4,6,8,10,max	18 (3 each)	$4 \cdot 10^{10}$ each	minBias
1	ELEHAD	p+Be	3,4,8,29	12 (3 each)	$2 \cdot 10^{11}$ each	minBias
2	MUON	Au+Au	2,4,6,8,10,max	30 (5 each)	$2 \cdot 10^{11}$ each	minBias
2	MUON	C+C	2,4,6,8,10,max	18 (3 each)	$4 \cdot 10^{11}$ each	minBias
2	MUON	p+Be	3,4,8,29	12 (3 each)	$2 \cdot 10^{12}$ each	minBias
3	HADR	Au+Au	2,4,6,8,10,max	12 (2 each)	$4 \cdot 10^{11}$ each	EB + Selector(s)
3	HADR	C+C	2,4,6,8,10,max	6 (1 each)	$8 \cdot 10^{11}$ each	
3	HADES	Ag+Ag	2,4	28 (14 each)	10^{10} each	
3	ELEHAD	Ag+Ag	2,4	8 (4 each)	$2 \cdot 10^{10}$ each	minBias

CBM at FAIR is ready for SIS100 beams in 2028



Towards CBM readiness in 2028

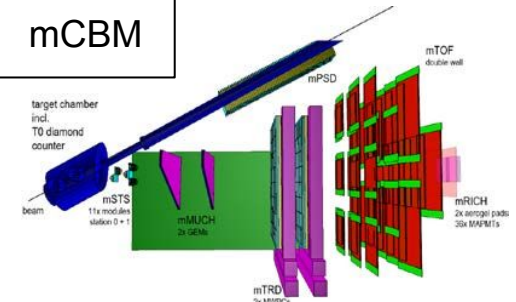


CBM cave & platform



- Cave is being prepared: platform installed
- Dipole magnet is funded: signing of the contract in the coming days
- CBM demonstrator at SIS18: mCBM
 - data taking started in 2019
 - Validating full online data taking and online reconstruction chain
 - All CBM subsystems contributes, Lambda peak is visible, ...

mCBM



GSI is a host laboratory for the CBM group

- About 40 scientists
- Among members are the world leading experts in major CBM physics cases (critical fluctuations, dileptons, flow/polarization, hypernuclei)
- Hub for computing, software, and online reconstruction development in the CBM Collaboration
- Detector technologies (STS lab, ...)
- Strong connection to neighboring universities who plays a major role in the CBM Collaboration
 - TU-Darmstadt
 - Frankfurt Uni
 - Heidelberg Uni
 - Uni Tuebingen
 - ...
- Heavy-ion programs for young scientists
 - HFHF: Helmholtz Research Academy Hesse for FAIR
 - EMMI: ExtreMe Matter Institute
 - EURIZON: European network for developing new horizons for RIs
 - ...

HFHF



eurizon
European network
for developing new horizons for RIs

Backup

Interaction rate

