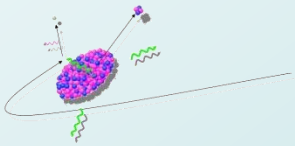
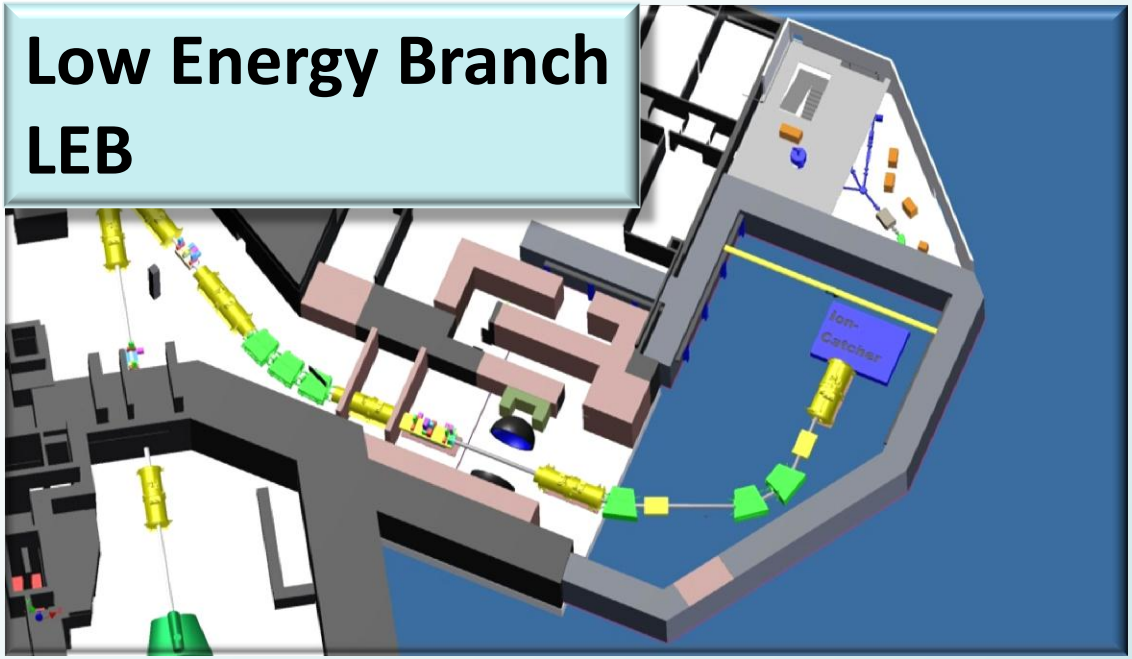
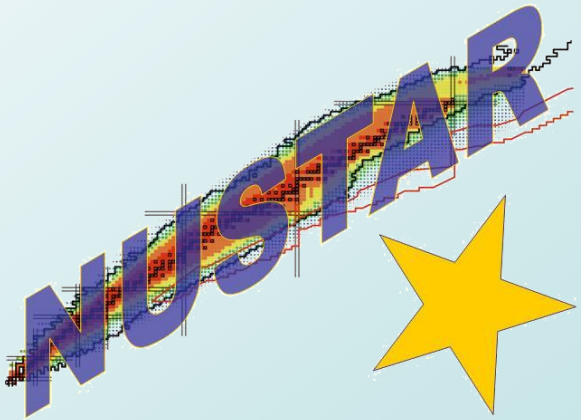
Status of the SuperFRS LEB







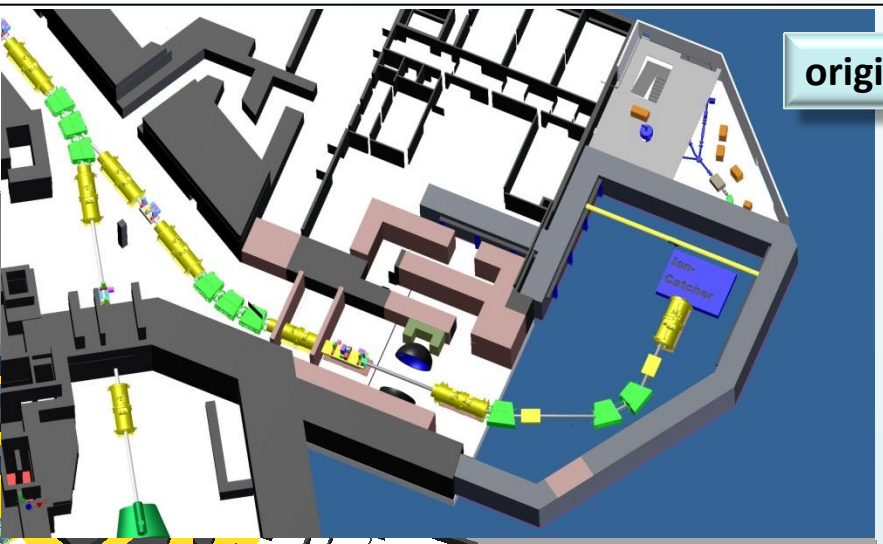
Dieter Ackermann

GSI
Helmholtzzentrum für Schwerionenforschung

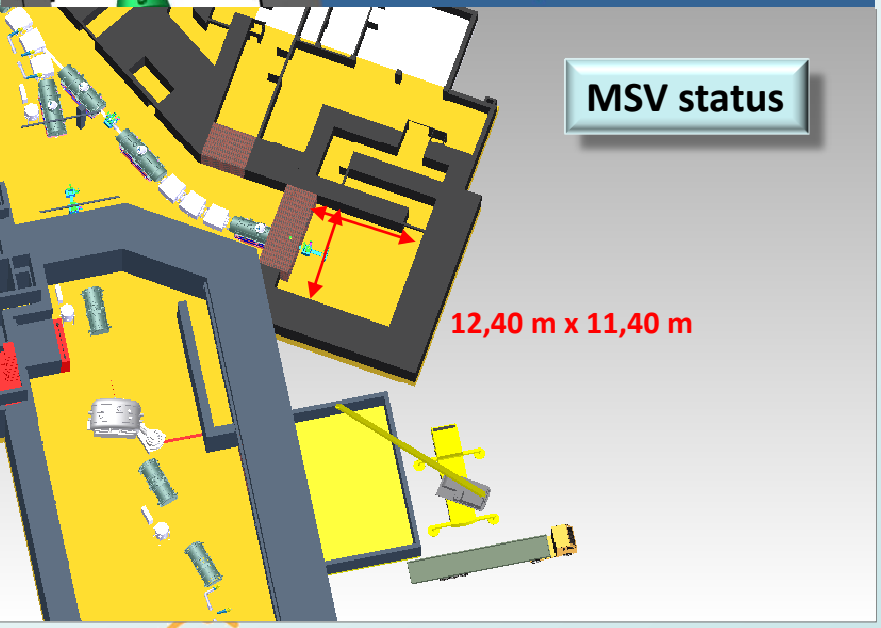
February 27th 2013

Low Energy Branch

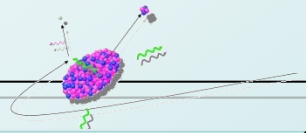
- status and perspectives



original plan



MSV status



present state

- *all magnets including spectrometer and E-buncher in MSV*
- *building only partly funded*

LEB task force

- *objectives and integration*

physics at the LEB

- *HISPEC/DESPEC, MATS and LASPEC*
- *SHE*
- *new ideas*

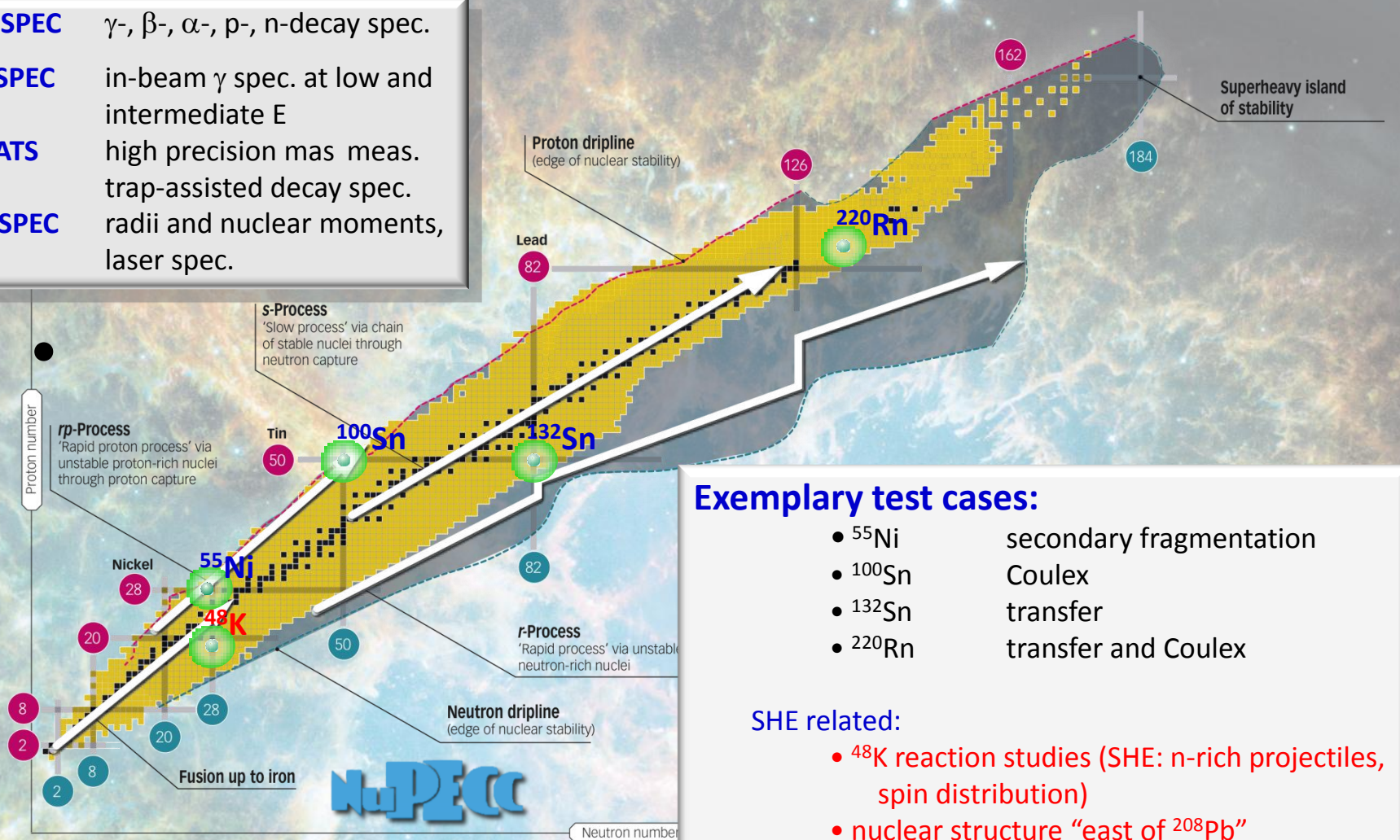
road map and next steps

- *building definition*
- *funding actions*
- *alternative approaches*

•Key Experiments

- Benchmarking the Project

DESPEC	γ-, β-, α-, p-, n-decay spec.
HISPEC	in-beam γ spec. at low and intermediate E
MATS	high precision mas meas. trap-assisted decay spec.
LASPEC	radii and nuclear moments, laser spec.



NuPECC Long Range Plan 2010

Exemplary test cases:

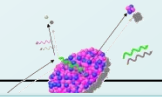
- ^{55}Ni secondary fragmentation
- ^{100}Sn Coulex
- ^{132}Sn transfer
- ^{220}Rn transfer and Coulex

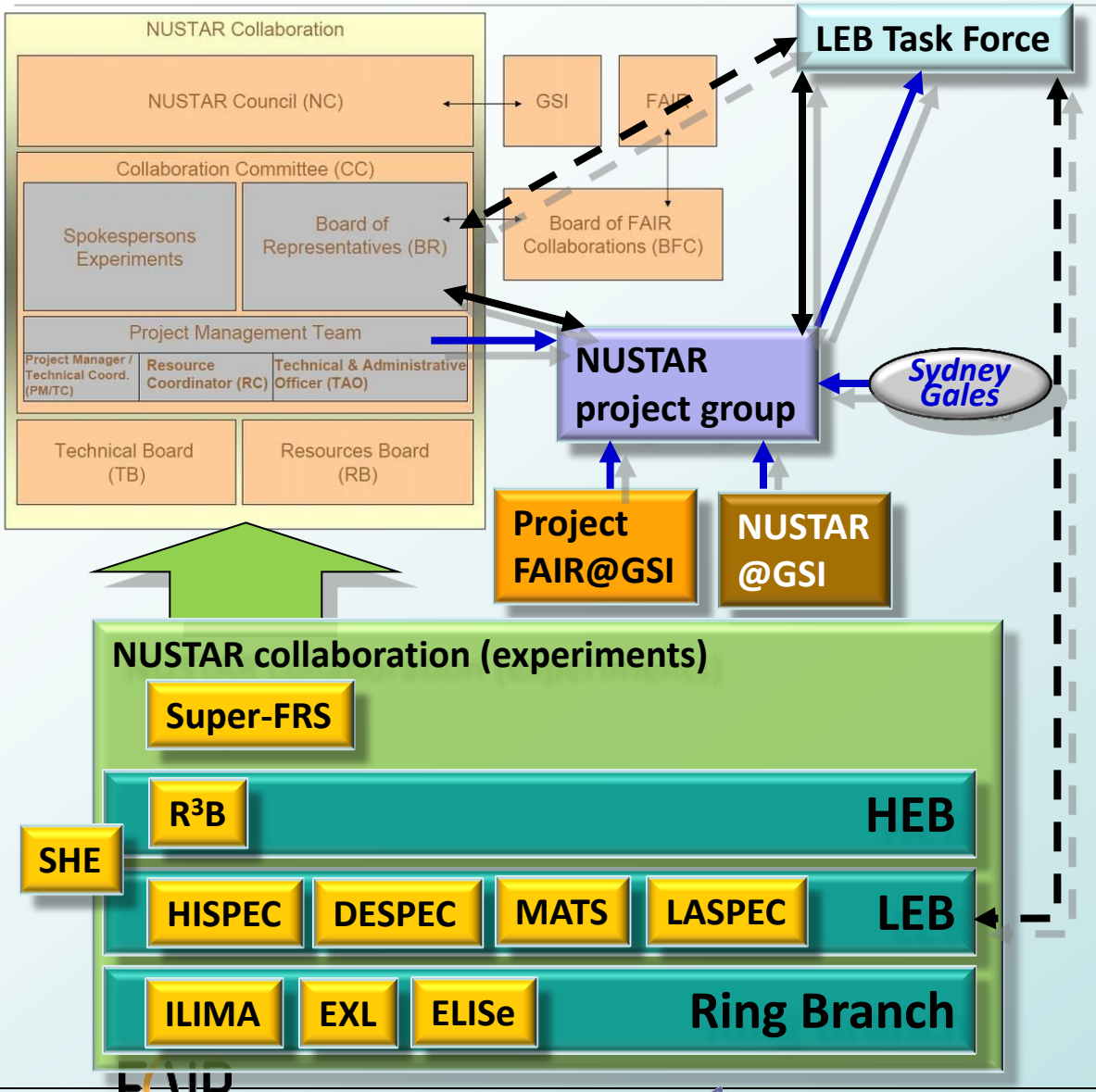
SHE related:

- ^{48}K reaction studies (SHE: n-rich projectiles, spin distribution)
- nuclear structure "east of ^{208}Pb"

LEB Task Force

- objectives and integration





Objectives

- *summarize physics goals*
- *finalize purpose and specifications of the instruments*
- *define the building + roadmap*

Task Force members

Dieter Ackermann (convener)
Hans Geissel
Jürgen Gerl
Alexander Herlert
Haik Simon
Helmut Weick
Martin Winkler

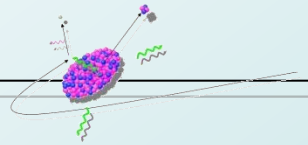
First meeting *December 14th 2012*

First actions

- *meeting with Rosner and Krämer*
- *definition of roadmap (in progress)*

LEB Task Force meeting with FAIR management representatives

- encouraging advices by G. Rosner et al.



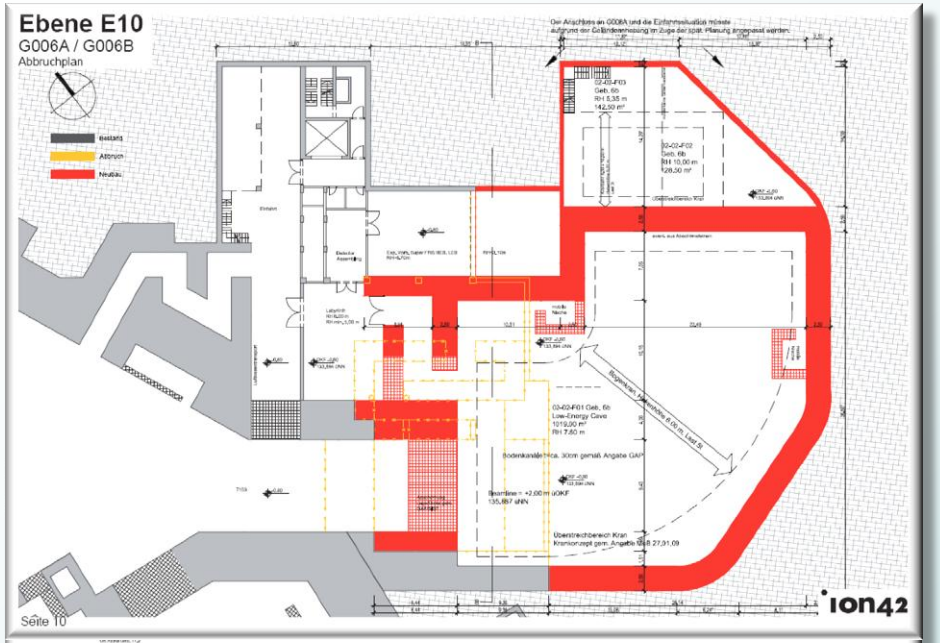
Meeting on strategy toward LEB building (January 11th, 2013)

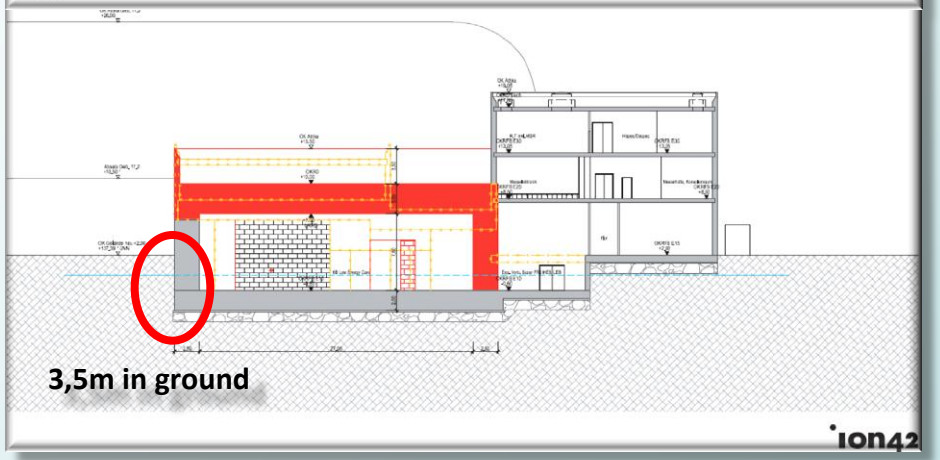
Participants: Jürgen Gerl, Alexander Herlert, Dieter Krämer, Inti Lehmann, Günther Rosner, D.A.

- present **LEB-building layout (functionality) seems to be the optimized** version for envisaged physics program
- **important to check alternative/intermediate** solutions until LEB building is realized
- **changes to MSV planning is very difficult if not impossible**
- one possible option is a **separate planning ("Z-Bau Antrag")** for which the funding has to be approved
- **FAIR management supports our initiative** and suggests to proceed with preparatory work like radiation safety calculations, detailing of building plans, and costing
- **FAIR Council** should only be **approached when a complete realization plan** including a secured funding scenario can be presented
- a possible approach to get **funding** is a request in the **FAIR-NUSTAR Resources Review Board (RRB) (set-up of a consortium)**

Civil construction project

- ION 42 – architect study 2012





Costing	
total cost	**12.746 k€**
site preparation	**100 k€**
building	**5.422 k€**
construction	4.818 k€
demolition	604 k€
infrastructure	**4.827 k€**
construction	4.541 k€
demolition	286 k€
outdoor installation	**261 k€**
shielding	**102 k€**

possible measures to reduce the costing

- **project staging**

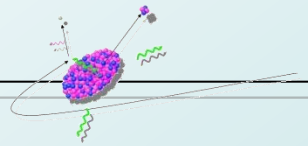
  1. first stage **light testing hall**
  2. second stage **experimental hall**

  mobile shielding will be adopted/added for stage 2

- **2nd study by ION 42**

Funding scenario

- project staging and NUSTAR Resources Review Board



- **project staging**

  1. first stage **“testing hall”**
  2. second stage **“experimental hall”**

  at the **NUSTAR week in Kolkata Oct. 2013** the Indian partners signalized the possibility of a financial contribution to the “testing hall” (infrastructure)

  The two functions of the building have equally high importance with full experimental hall planning approval from the beginning.

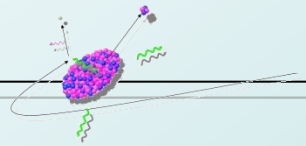
- **FAIR Resources Review Board (RRB) for NUSTAR – will be installed in mid-2013**

  installation of a **consortium** of the FAIR partner countries interested in the LEB

  - via the **NUSTAR Resource Board (RB)** – this week
  - **RB** representatives approach **national funding agencies** for possible resources
  - **RB** representatives approach their **FAIR RRB (NUSTAR) members** for concerted action to support the LEB funding request in the NUSTAR RRB as soon as the cost caculations are availble in **mid-2013**

Radiation Levels

- expected rates and first calulations



staged building forsees mobile shielding

first calculations

10^4/s U-ions

E = 0.3 GeV/u

99% E-loss in Si target

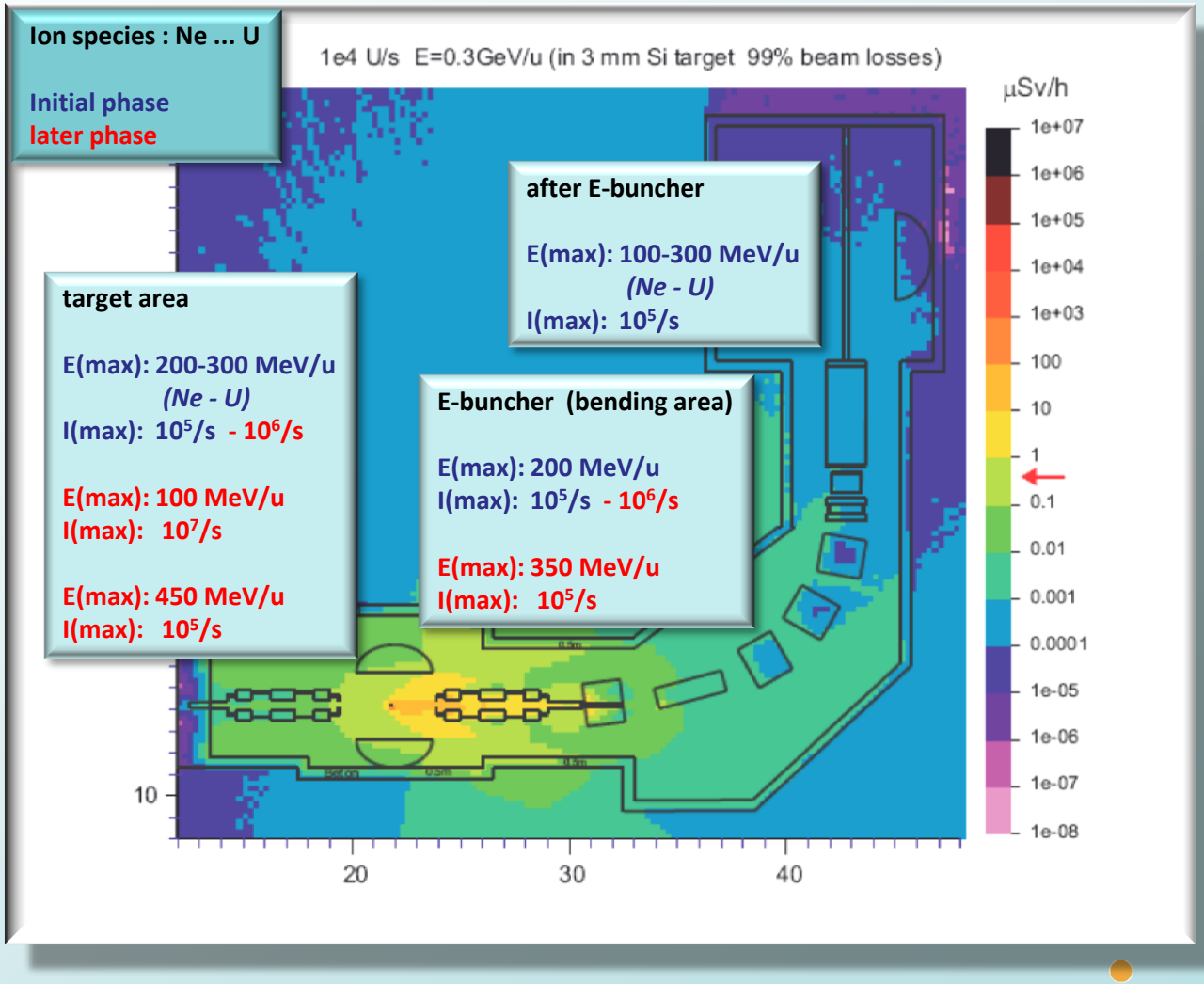
shielding needed < 0.25 m

calculations for higher rates

end of February 2013

shielding scales with rate

Galina Freml (GSI radio protection dep.)



Radiation Levels

staged bu
mobile sh

first calcu

10^4/s U-ion

E = 0.3 GeV

99% E-loss

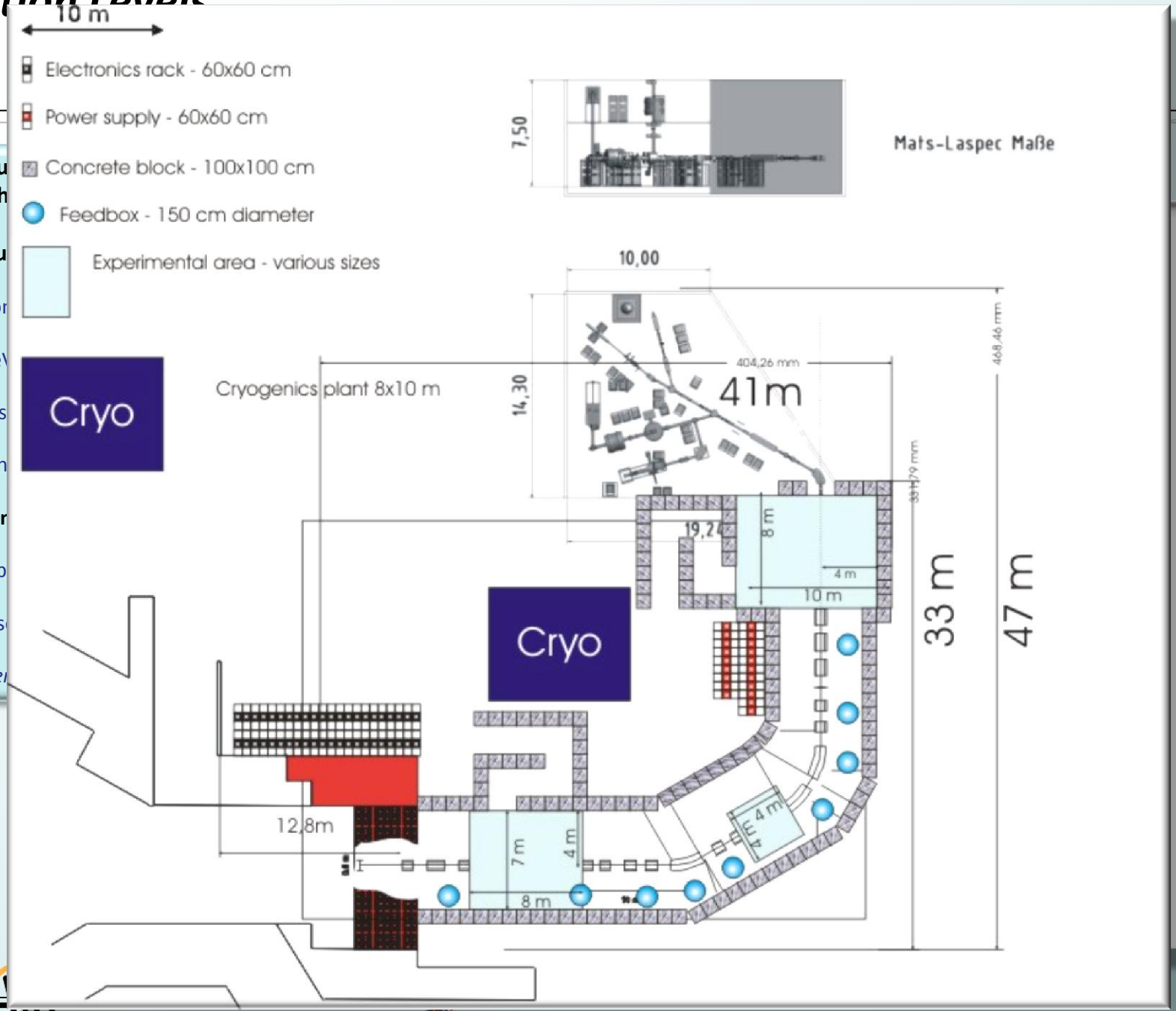
shielding n

calculation

end of Feb

shielding s

Galina Fre



Time line for LEB Task Force actions

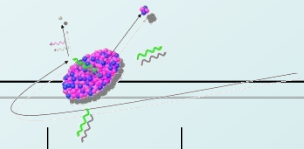
- „operative synchronisation“ with the MSV

Modularized Start Version (MSV) civil construction
(source: Dieter Krämer, private communication)

- finalising the tender specifications (LV's) mid of 2013
- start the call for tenders end of 2013
- start of construction mid 2014

This translates in the following action schedule:

1. February 27th 2013 (NUSTAR Annual Meeting)
   finalizing the LEB building dimensions on the basis of the physics and radioprotection requirements
   - no changes to the building foot print after that!
2. march 2013 – mid-2013
   2nd building study Ion 42
3. mid-2013
   RRB's will be formed
   first global MSV cost calculations
4. now/summer 2013 to end 2013
   fund raising



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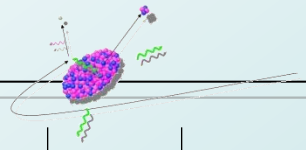

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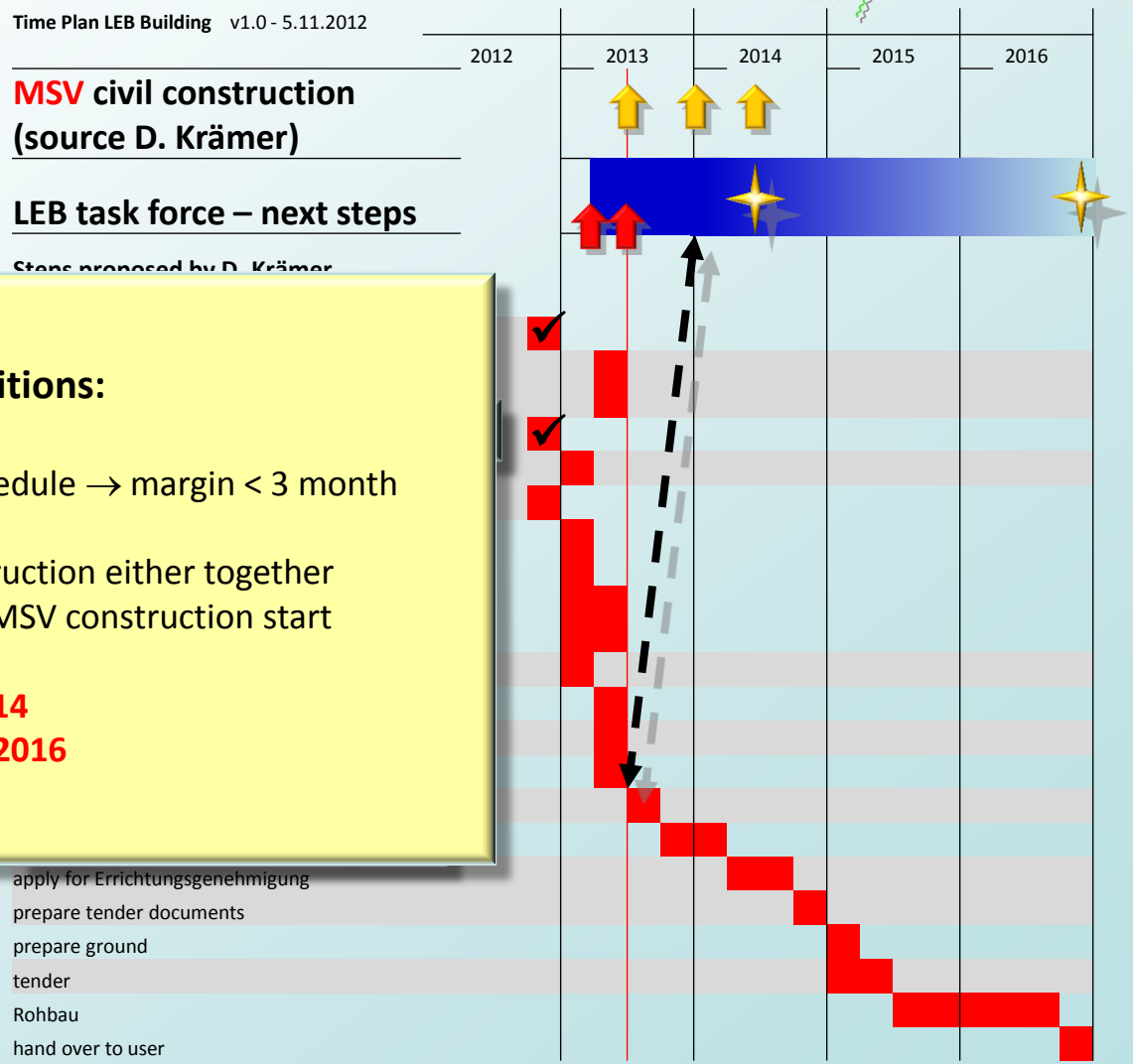
   first global MSV cost
4. now/summer 2013 to end 2013
   fund raising

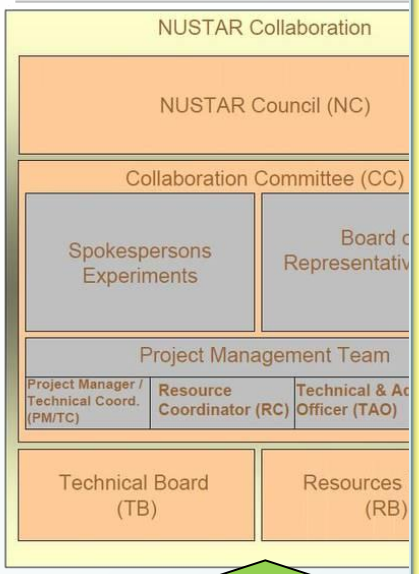
boundary conditions:

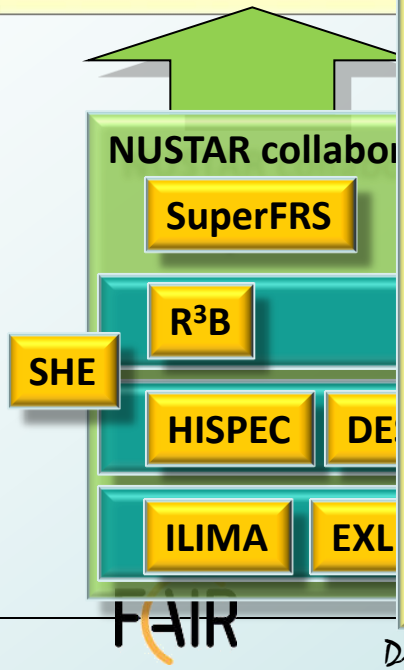
- very tight schedule → margin < 3 month
- start of construction either together with or after MSV construction start
  - **mid 2014**
  - **end of 2016**



LEB Task Force

- objectiv





Action summary

- staged approach to be initiated **now!**
- check alternative/intermediate solutions
- funding scheme:
  - Indian contribution testing hall
  - consortium → NUSTAR RRB

Discussion items and decision issues

- physics case to be wrapped up today (February 27th 2013)
  → freeze building dimensions
- LEB coordination
  - NUSTAR Collaboration (CC/BR)
    → installs/affirms LEB coordinator
- general comments and criticism

sics goals
e and specifications
nts
ding + roadmap

bers

(convener)

cember 14th 2012

osner and Krämer
admap (in progress)