Large Acceptance Multi-Purpose Spectrometer (LAMPS) Schedule, Budget, & Collaboration

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LAMPS Review

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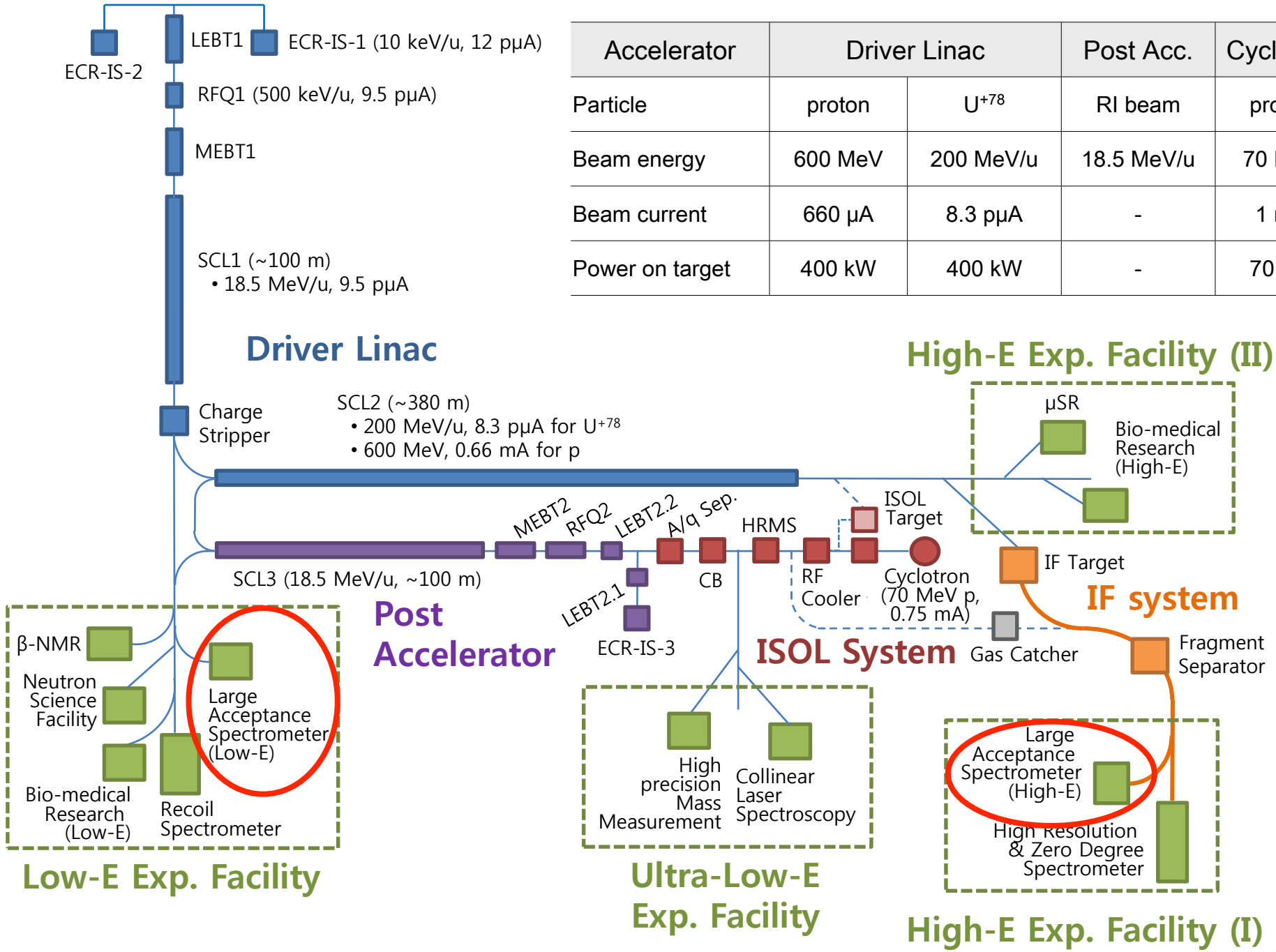
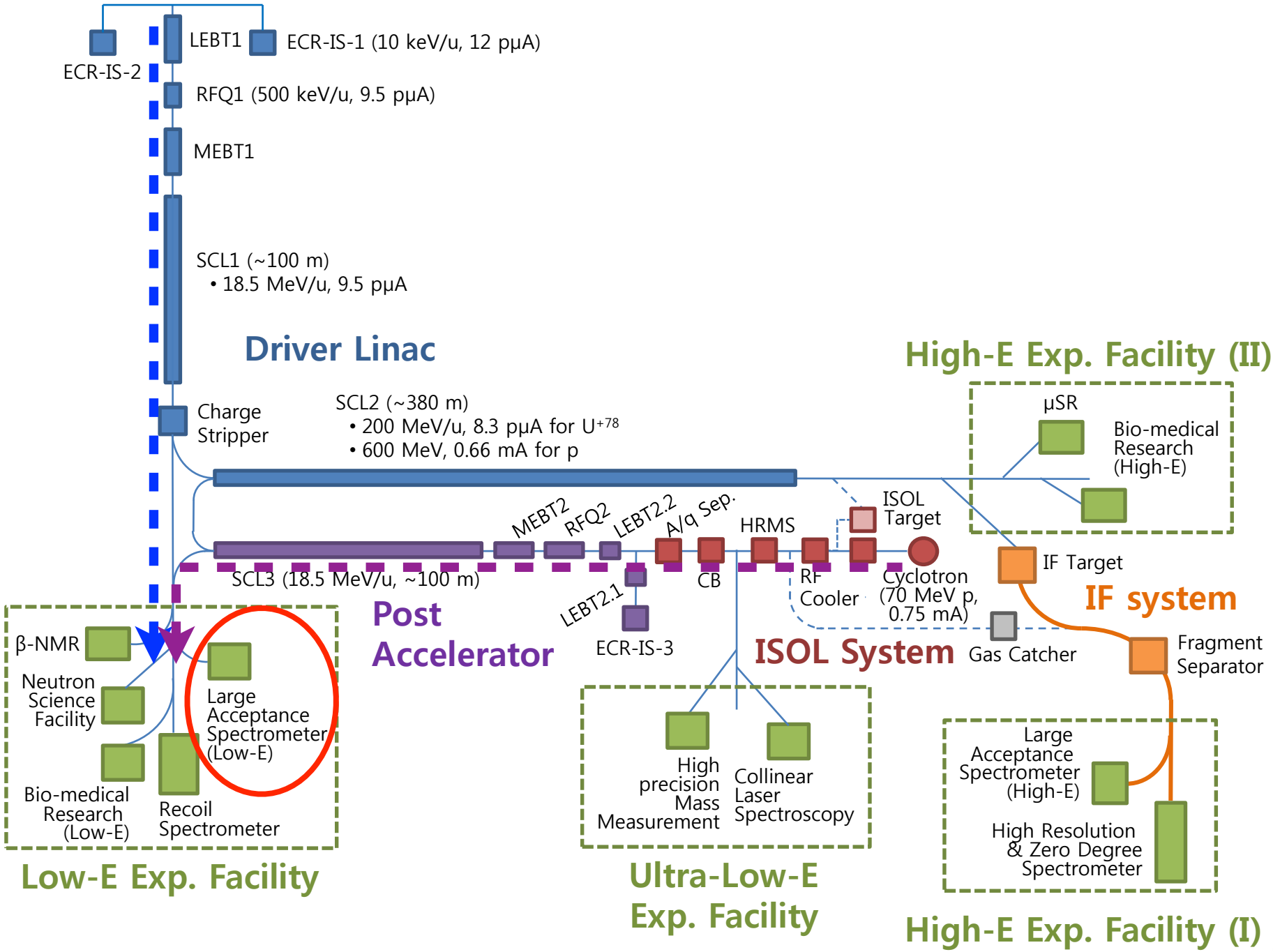
RAON Accelerator & Experimental Facilities

Accelerator	Driver Linac		Post Acc.	Cyclotron
Particle	proton	U^{+78}	RI beam	proton
Beam energy	600 MeV	200 MeV/u	18.5 MeV/u	70 MeV
Beam current	660 μA	8.3 pμA	-	1 mA
Power on target	400 kW	400 kW	-	70 kW



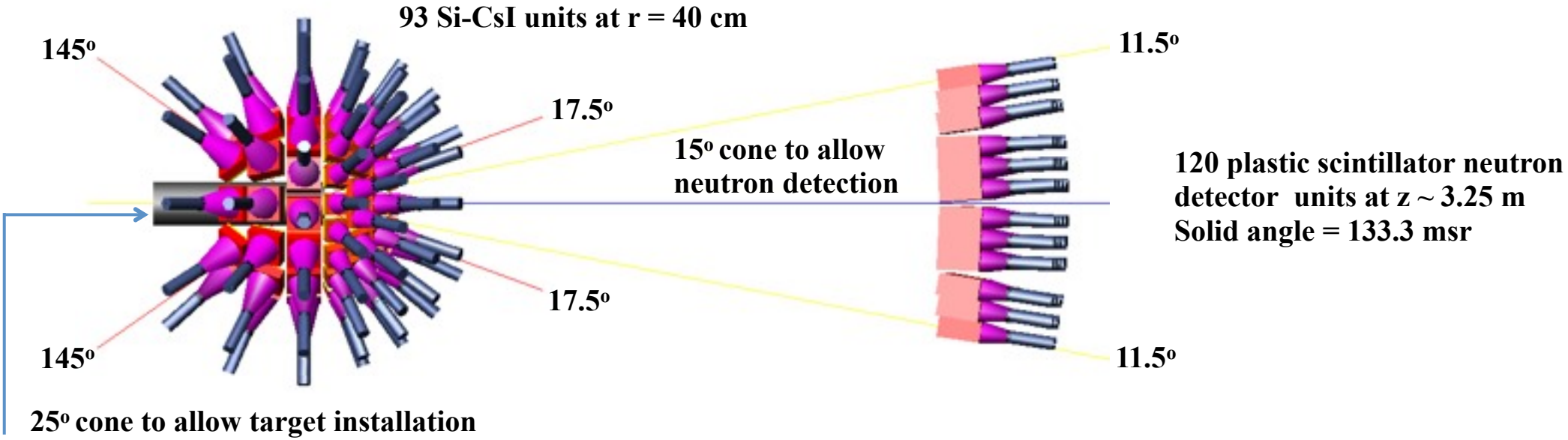
LAMPS Experimental Facilities

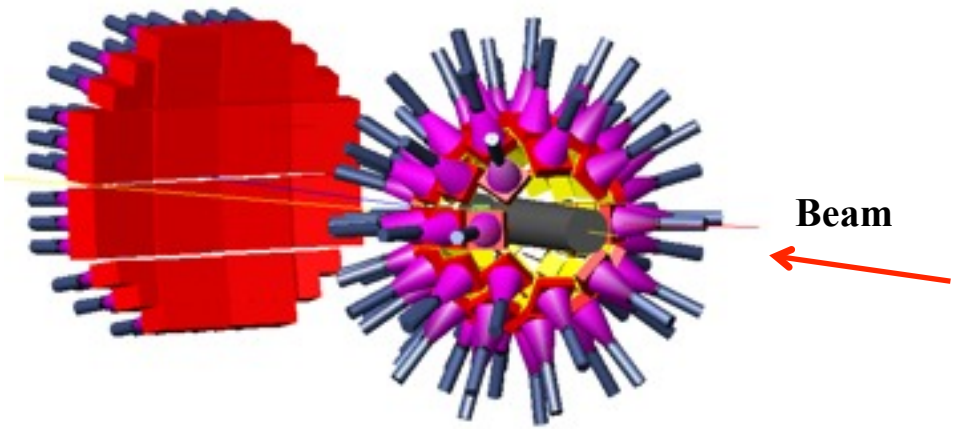


Low Energy LAMPS Experimental Setup

$E_{beam} < 18.5A$ MeV

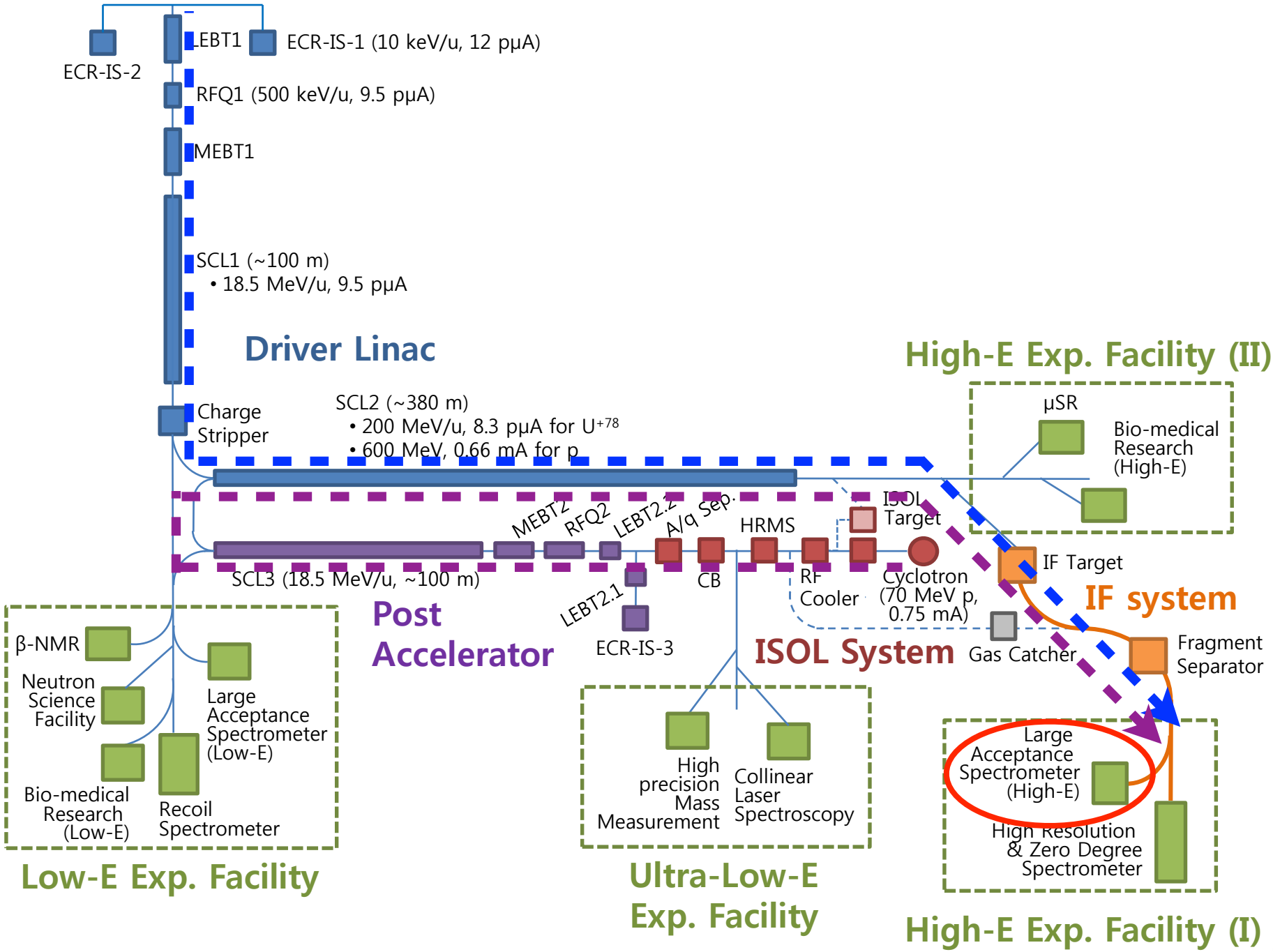
For GDR Experiments (to test PDR measurements as well)





^{50,54}Ca, ^{68,70,72}Ni, ^{106,112,124,130,132}Sn RI beam
+ ^{197}Au/^{208}Pb (stable target)
+ ^{12}C/no target (background control)
❖could be possible from ISOL

LAMPS Experimental Facilities



High Energy LAMPS Experimental Setup

18.5*A* MeV< E_{beam} < 250*A* MeV

For Heavy-Ion Collision Experiments

-Reactions:

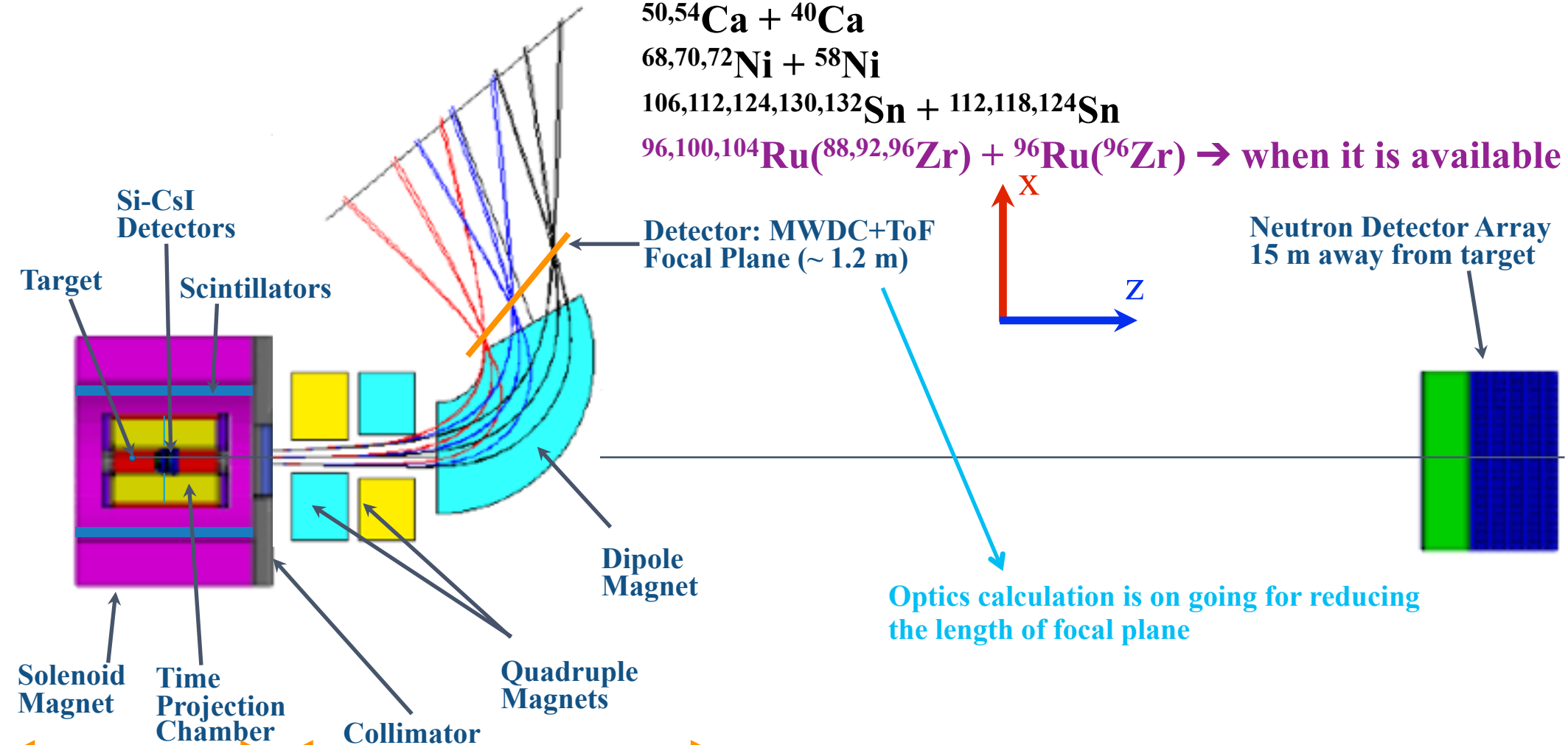
Central and peripheral collisions

$^{50,54}Ca + ^{40}Ca$

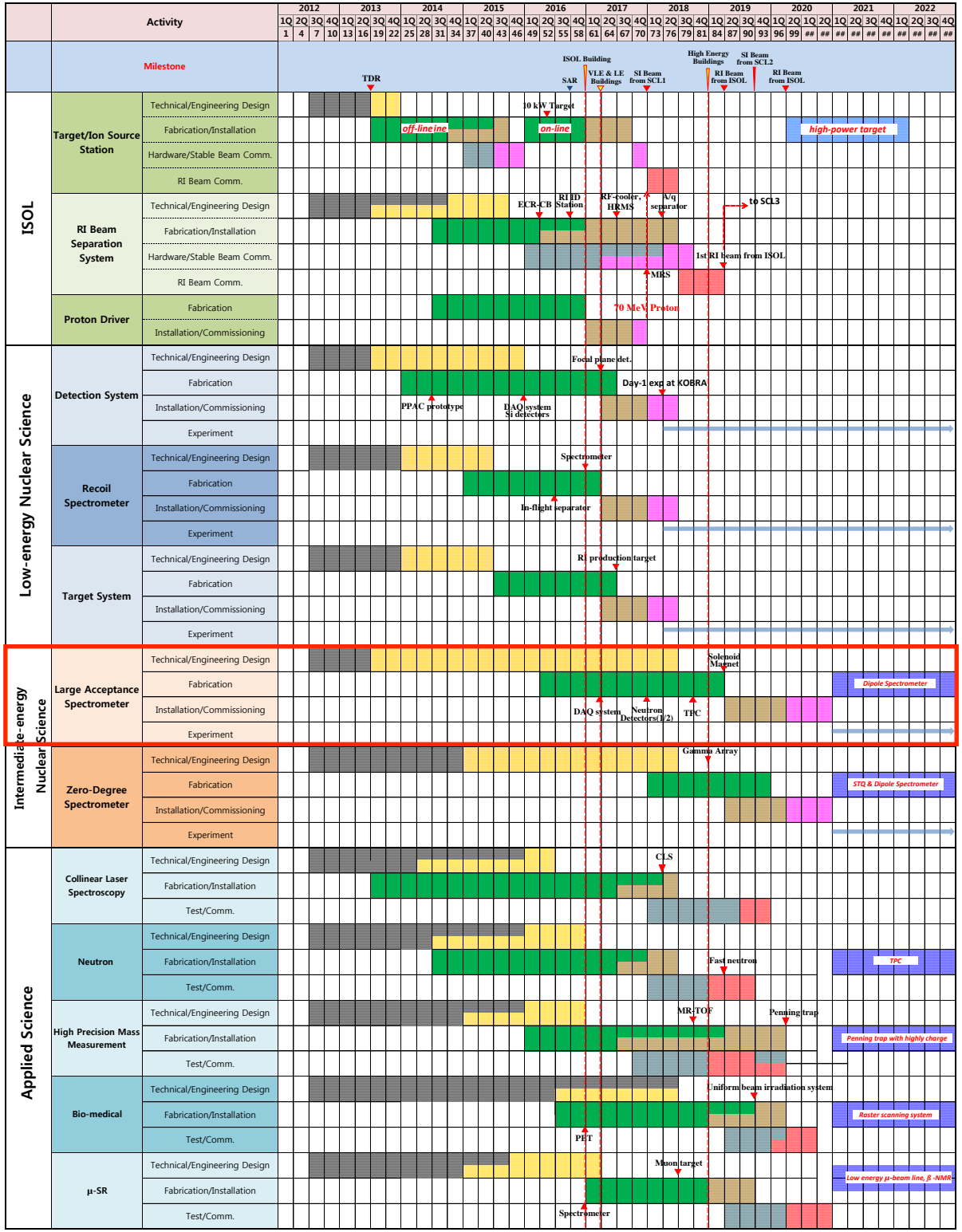
$^{68,70,72}Ni + ^{58}Ni$

$^{106,112,124,130,132}Sn + ^{112,118,124}Sn$

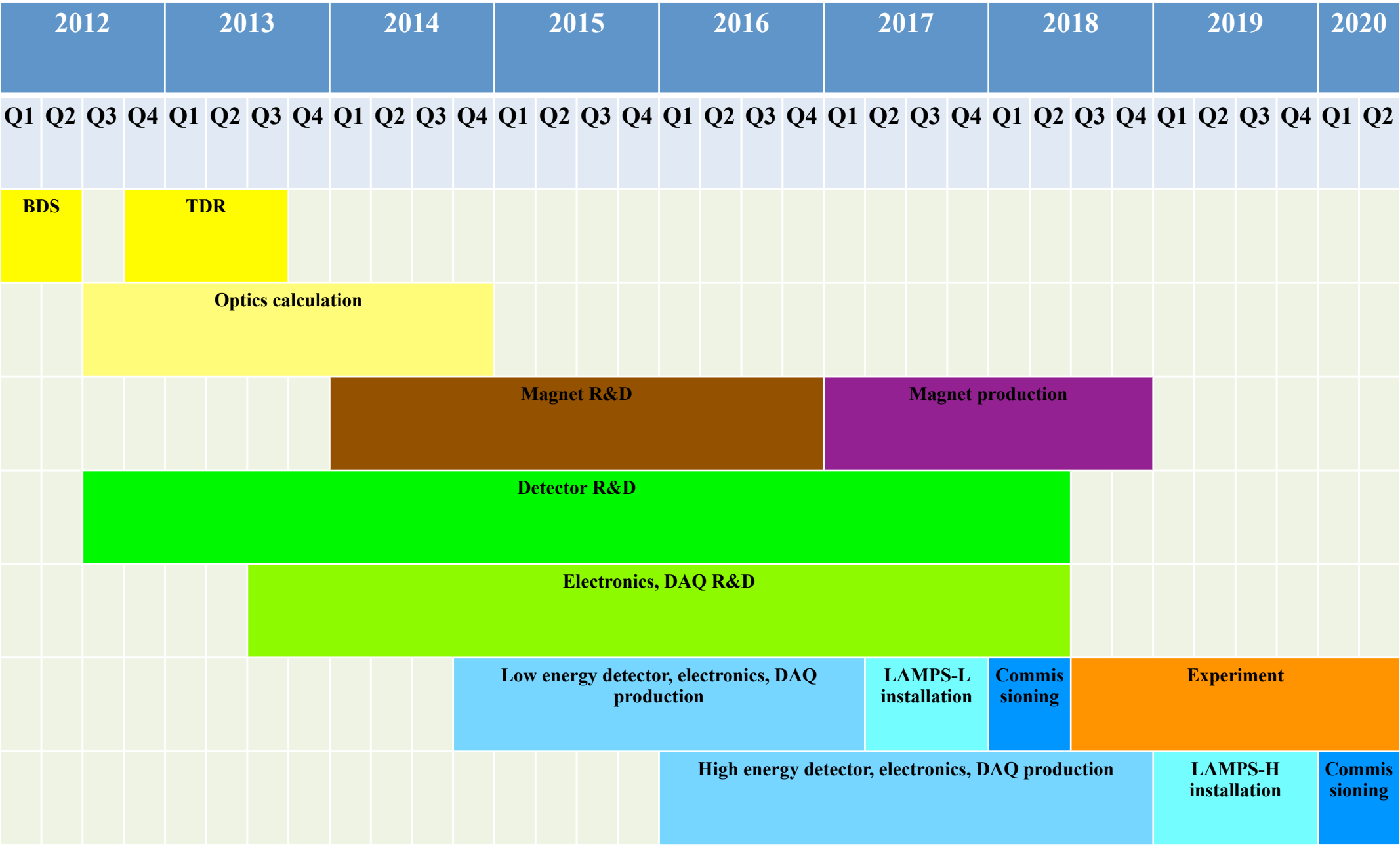
$^{96,100,104}Ru(^{88,92,96}Zr) + ^{96}Ru(^{96}Zr)$ ➔ when it is available



RAON Schedule



LAMPS Schedule



Budget

Item	Budget (M USD)
Low Energy Detector & Electronics	3.3
High Energy Detector & Electronics	26.7
Start Counter & Solid Target	0.6
DAQ & DAQ Electronics	2.2
Total	32.8 (-11.2)
Currently available budget	23.4 (21.6)
Item	**Budget (M USD)**
Dipole Spectrometer	8.9
Si-CsI	2.3
Total	11.2

In order to fit to currently available budget, dipole spectrometer and Si-CsI detecter at high energy experimental setup will be for the upgrade

- Forward fragmentation measurement
- PDR/GDR resonance measurement
- Nuclear structure study (e.g. Coulomb breakup)

Collaboration

Domestic

- Korea University
  - -Neutron detector R&D
  - -TPC R&D
  - -GEANT-4 simulation
- Chonbuk National University
  - -Low energy physics
  - -GEANT-4 simulation
- Kyungpook National University
  - -Si detector R&D
- Inha University
  - -TPC tracking algorithm

International

- GSI
  - -Triggerless DAQ
  - -Diamond detector
- GANIL, Saclay, RIKEN, J-PARC
  - -TPC electronics

23 people from 5 institutes

Looking for more collaborators from both domestic and international

➢ **To form international collaboration**

R&D Plan, Production Plan

- Solenoid magnet design is completed
  - Need to figure out production feasibility
  - Communicate with domestic and foreign magnet companies
- Si-CsI detector & neutron detector are commonly used at both experimental setups
  - Electronics also can be common
- TPC detector and electronics are quite complicated
  - Need longer R&D time than other detectors

❖R&D and production of most of detectors will be done with domestic people

❖Adapt advanced electronics & DAQ system from foreign research institute and modify

◉For future upgrade

➡Longer optics calculation for better dipole spectrometer performance

- After optics calculation completed, magnet design will be started & focal plane detector design will be fixed

➡Build Si-CsI detector at high energy experimental setup

Thank for your attention!