

A-4 Session “Beam loss & halo dynamics”

13:30 - 13:50 Yoichi Sato
Session Chair

Lead talk: Beam Loss and Halo Dynamics
Answers of J-PARC Main Ring to Session Q

13:50 - 14:05 Trent Thompson

Observations of mismatch-driven halo
in 2.5 MeV H- beam at the SNS Beam Test Facility

14:05 - 14:20 Shouyan Xu

Space Charge Effect Simulation and Tune Optimization
for Reducing Beam Loss at CSNS

14:20 - 14:35 Esmaeil Ahmadi

Experimental and Simulation Studies of
Non-linear Resonances in the ISIS Synchrotron

14:35 - 15:00 Yoichi Sato
Session Chair

Discussion Session A-4

Question to A-4 Session

How to design a next-generation highest-intensity facility?
from the particular view point of the A-4 session topic
“Beam loss & halo dynamics”

Beam halo can be defined as a part of beam touching physical aperture or collimators

To reduce the beam halo development

Measures	Initial Design	Post Design + Study Time
A) Enlarge physical / dynamic aperture	Main devices	Optics Improvement
B) Avoiding / killing transition energy	Arc design	---
C) Avoiding the betatron resonance lines	Base Tune	Tune survey
D) Suppressing betatron resonances	Place of post-works	Adding Corrections
E) Removing resonance sources	Lattice design?	Lattice Re-design?
F) Linear mitigation of SC	Higher energy	Longitudinal control

Measures for insability, beam loss source but not from the beam halo development

Impedance budget control, Sllipage opt., FB system, Chromatic control, Longitudinal control, ...

*Mixture of **initial** and **post** works*

Initial works are very important, but Post works can perform some

Challenge cost limits (budget/ time/ manpower) always!

My lead talk
shows

Answers of J-PARC Main Ring to Session Q

Discussion for Our Future

How to design a next-generation highest-intensity facility?
from the particular view point of the A-4 session topic
“Beam loss & halo dynamics”

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To reduce the beam halo development

Measures

- A) Enlarge physical / dynamic aperture
- B) Avoiding / killing transition energy
- C) Avoiding the betatron resonance lines
- D) Suppressing betatron resonances
- E) Removing resonance sources
- F) Linear mitigation of SC

Initial Design

Main devices
Arc design
Base Tune
Place of post-works
Lattice design?
Higher energy

Post Design + Study Time

Optics Improvement

Tune survey
Adding Corrections
Lattice Re-design?
Longitudinal control

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