Concluding Remarks

NFMCC Collaboration Meeting

UCLA

February 1, 2007

Harold G. Kirk
Brookhaven National Laboratory

On Going Activities

MERIT

MICE

Mucool

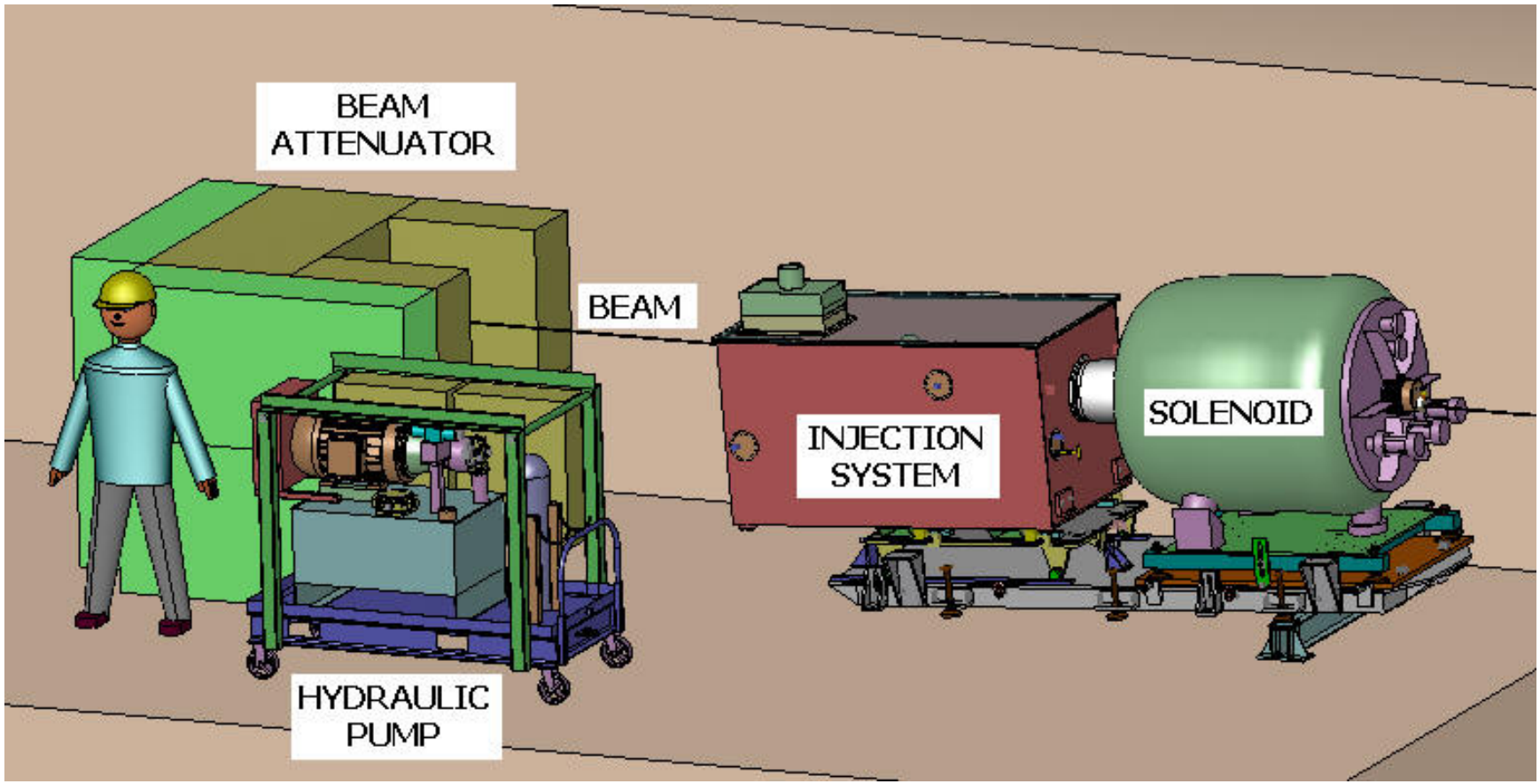
ISS

Solid Target Studies

6-D Cooling

The State of the Collaboration is Excellent!

The MERIT Experiment



MERcury Intense Target

Beam on Target July 2007

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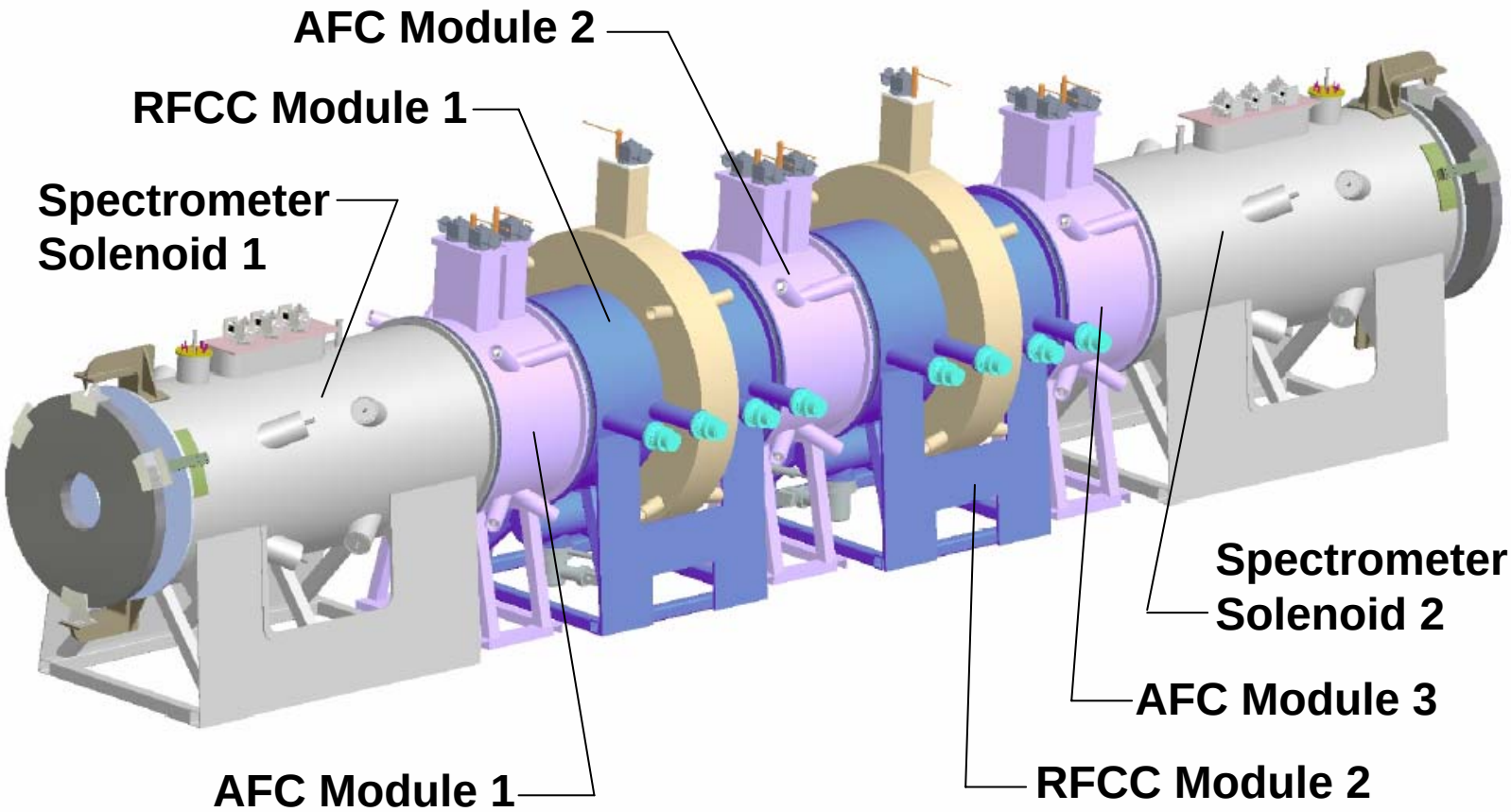
The MICE Experiment



Beam Characterization August 2007

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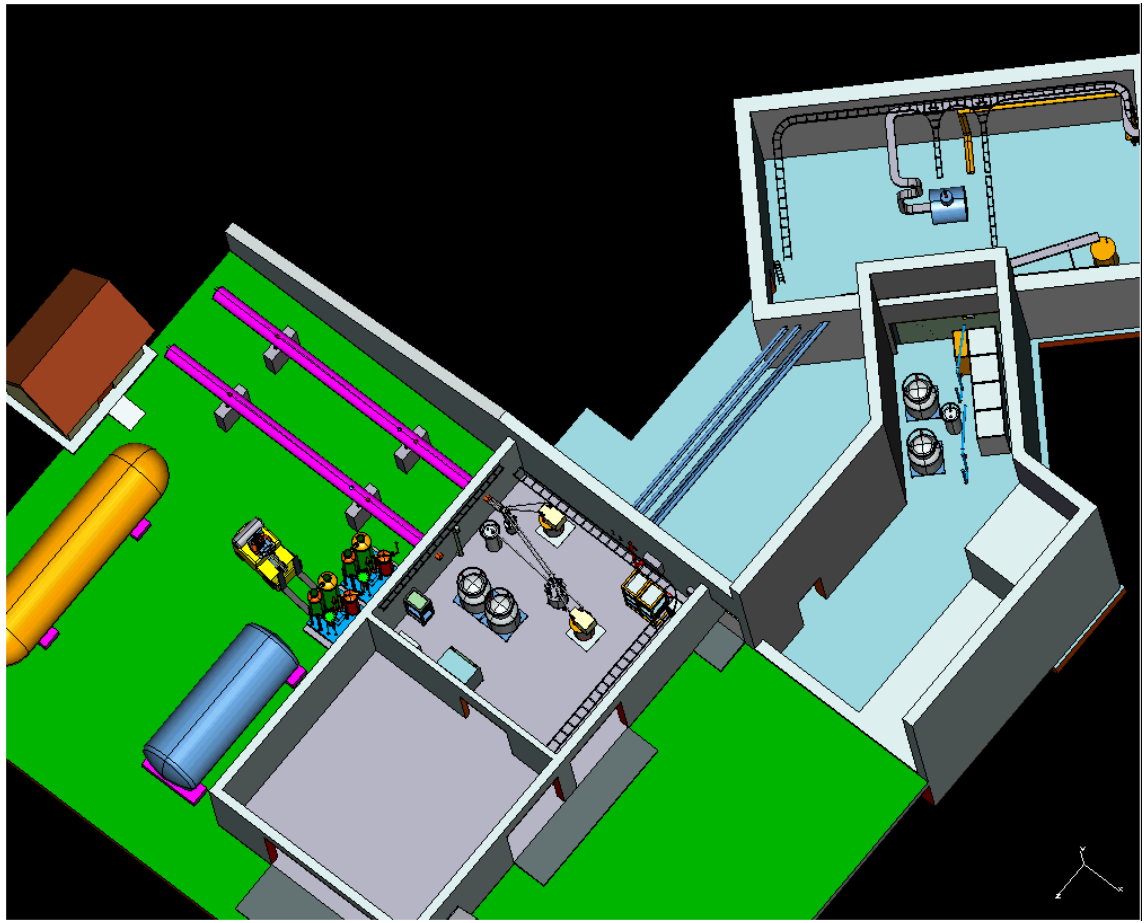
Mucool

The MTA is the focus of Mucool activities:

- **RF testing (805 and 201 MHz)**
- **High pressure H_2 gas-filled RF**
- **LH_2 Absorber tests**
- **High Intensity Beam**
  - **Will start with low intensity**



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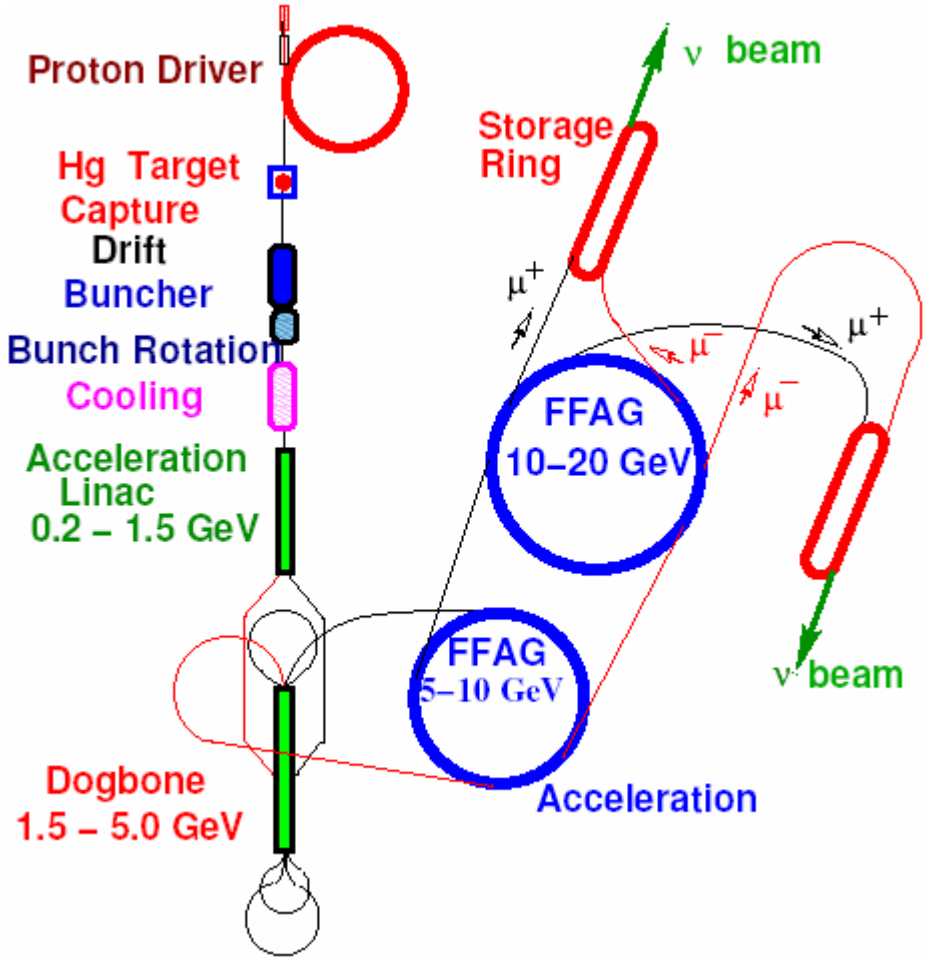
International Scoping Study



The ISS Baseline

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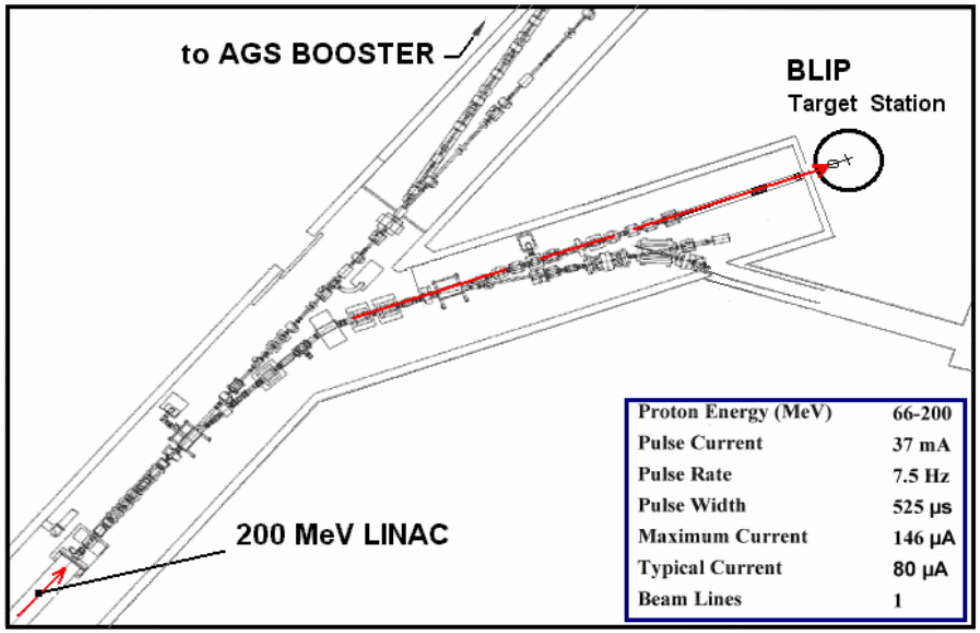
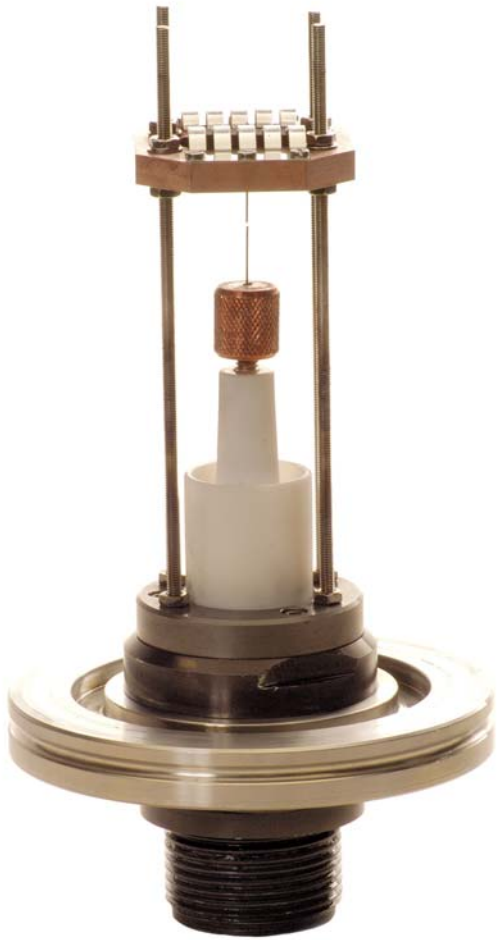
Solid Target Studies



BNL-Materials Irradiation at BLIP



RAL-Longevity Studies with High Energy Depositions

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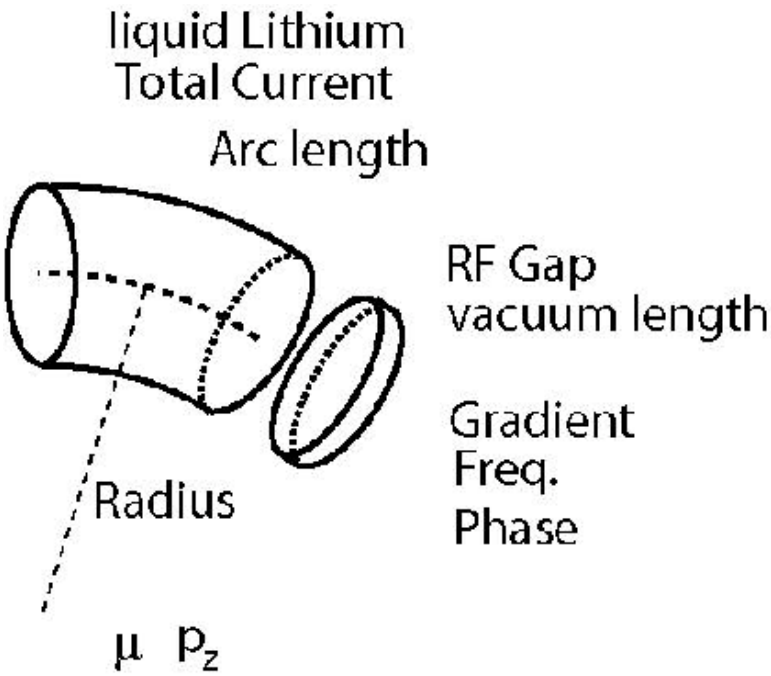
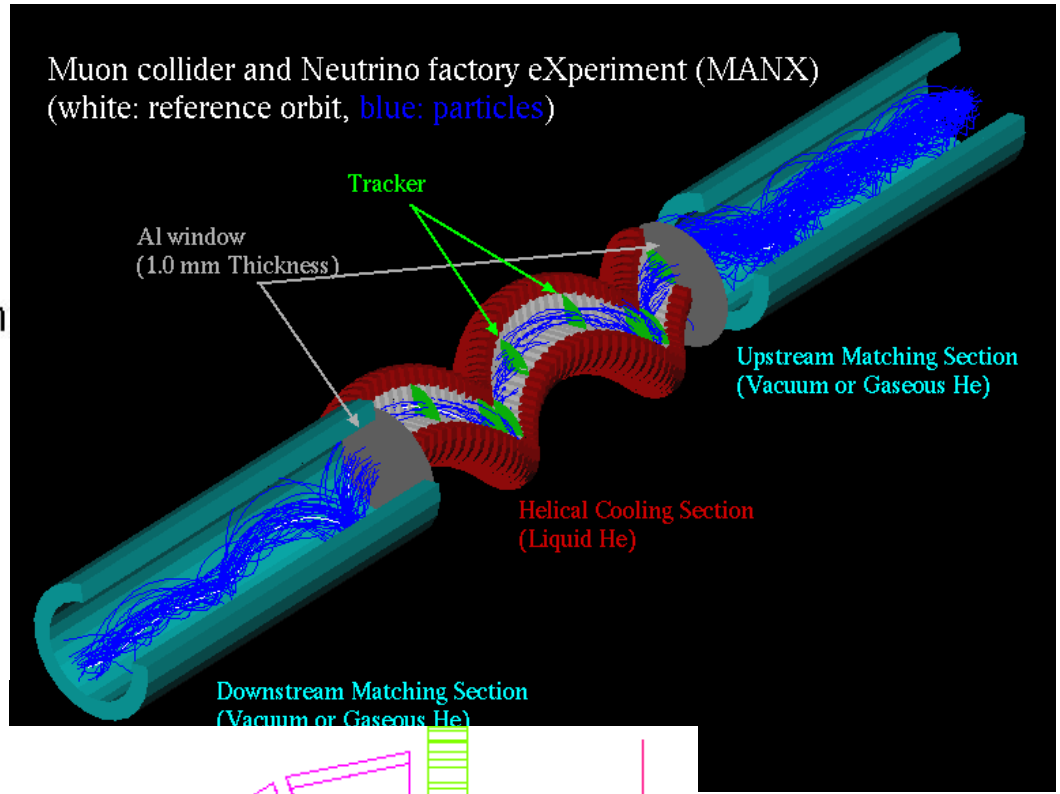
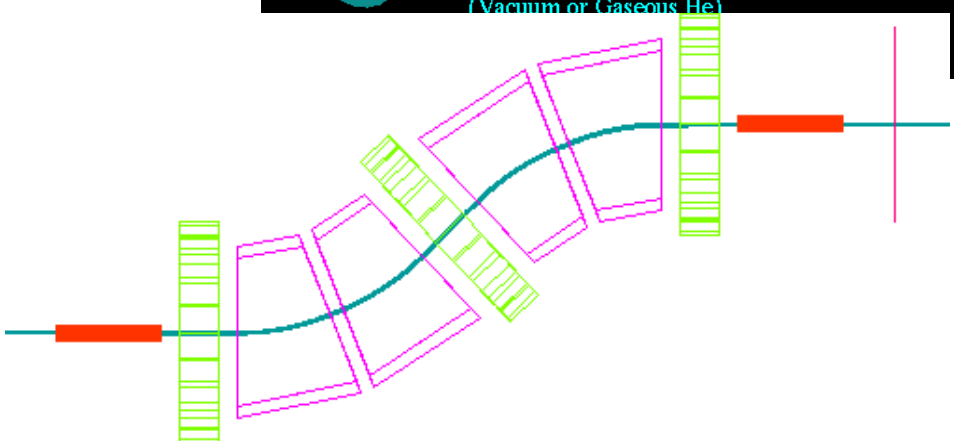
6D Cooling Studies





Fukui-Bent Li Lens



Muons, Inc
Manx, PIC, and REMEX

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New Ideas and Initiatives

Low Energy Neutrino Factory -- S. Geer

A Three Pass Cooling Channel -- G. Rees

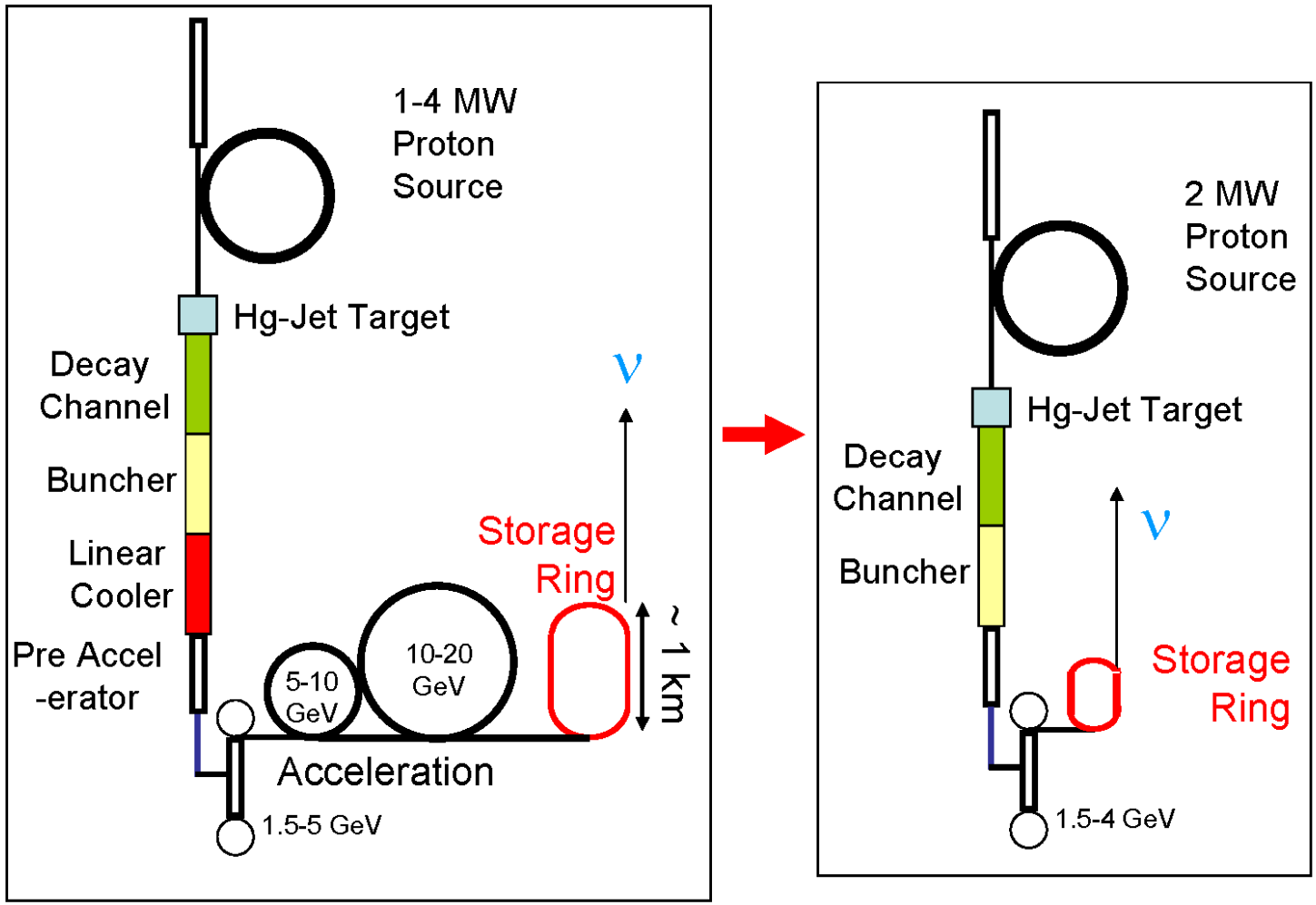
EMMA -- R. Edgecock

IDS – Ken Long

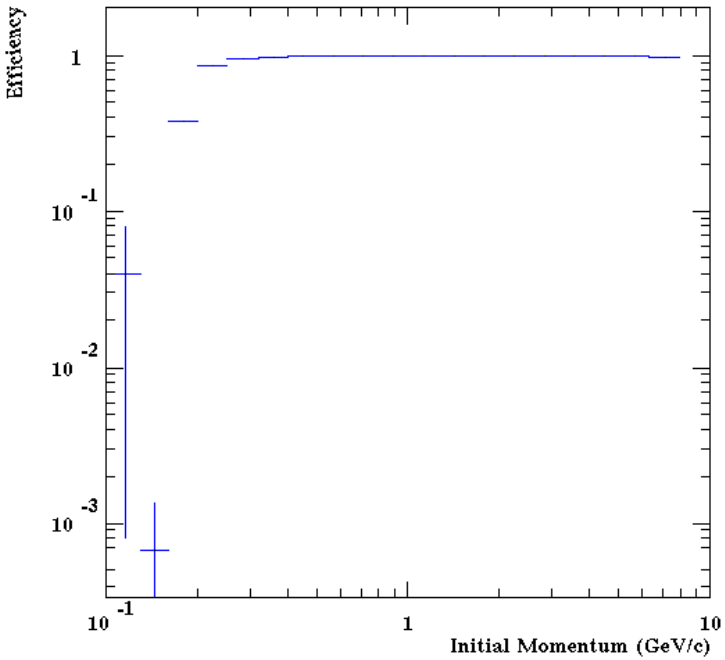
High Field Solenoids – R. Palmer, Muons Inc

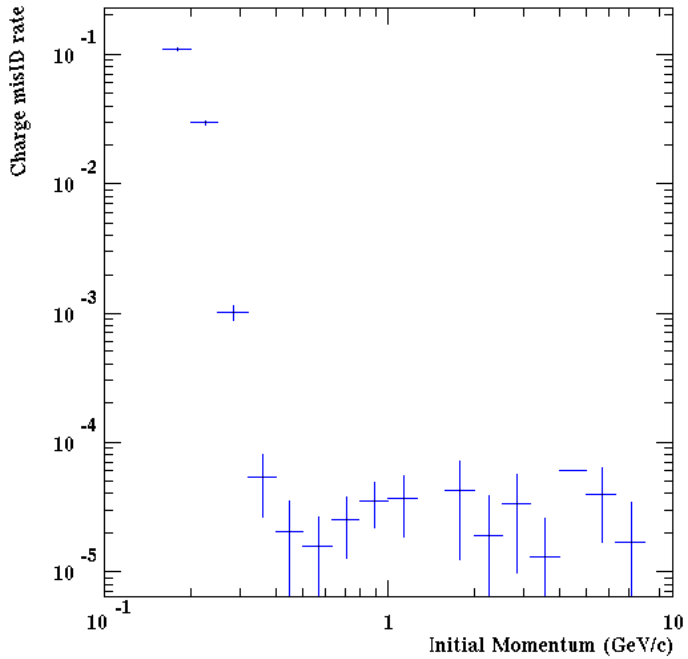
MERIT ' - Pb-Bi Eutectic

Low Energy Neutrino Factory



Totally Active Scintillator Detector





Muon Charge separation down to 400 MeV/c

Major Issue: Insert magnet field in 15m x 15m x 100m volume

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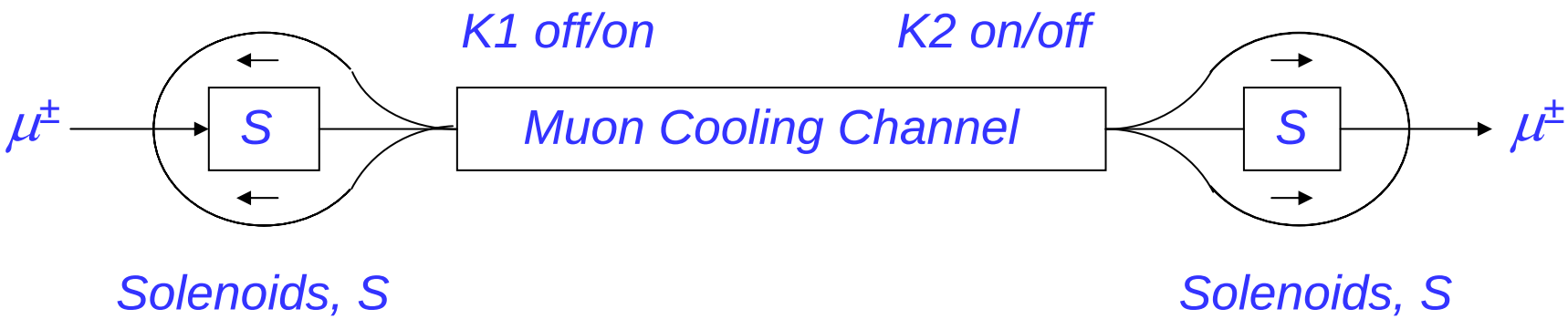
Schematic of Dog-bone Re-circulator

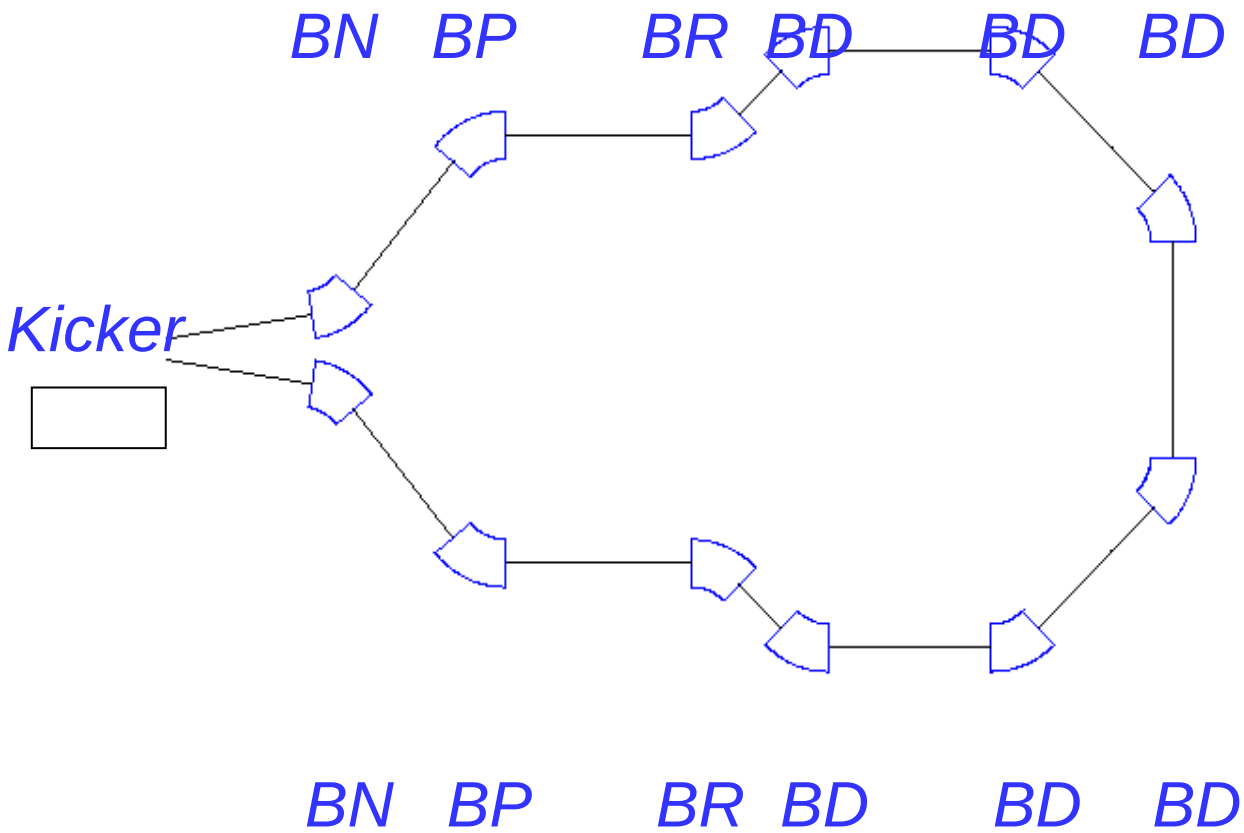


Re-circulator End Loop

Bend sequence:

Kicker – 9°
BN – 42°
BP + 51°
BR – 45°
BD + 45°
BD + 45°
BD + 45°

Mirror symmetry for return bends



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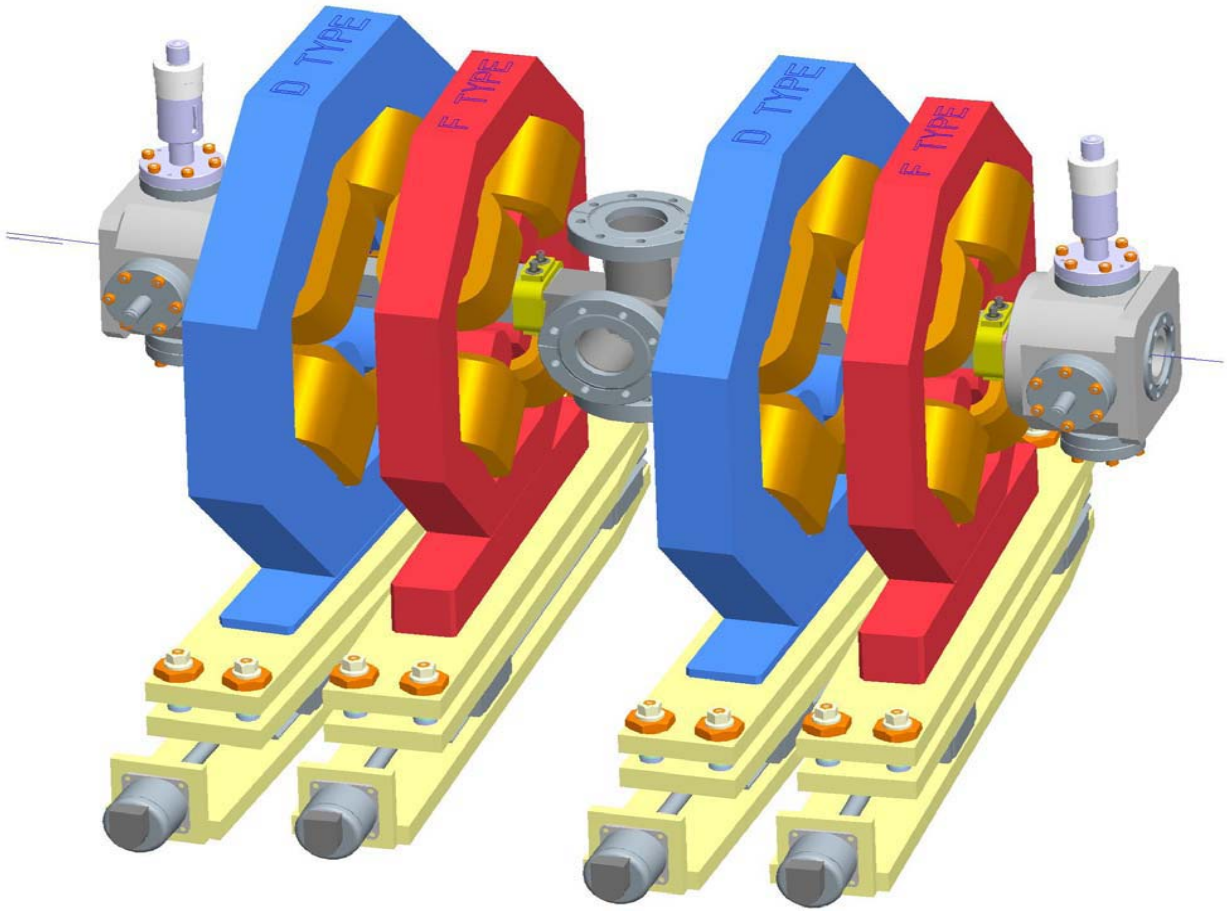
The EMMA Cell



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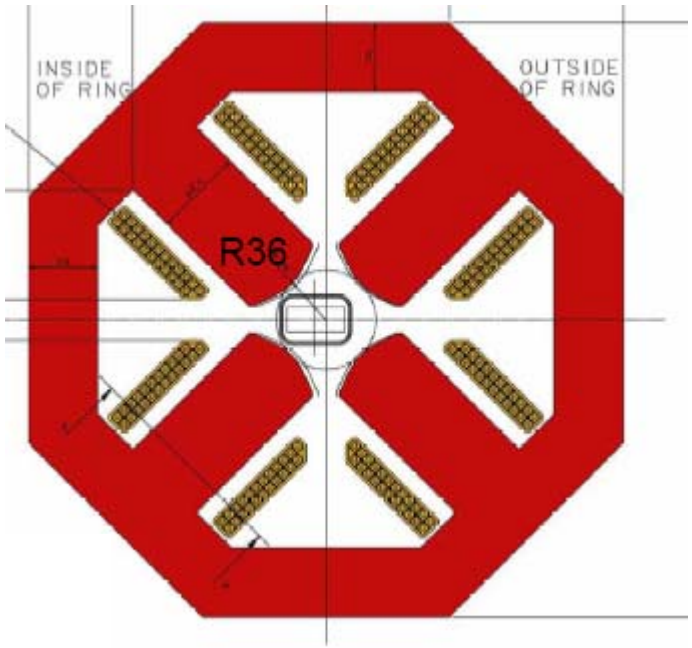
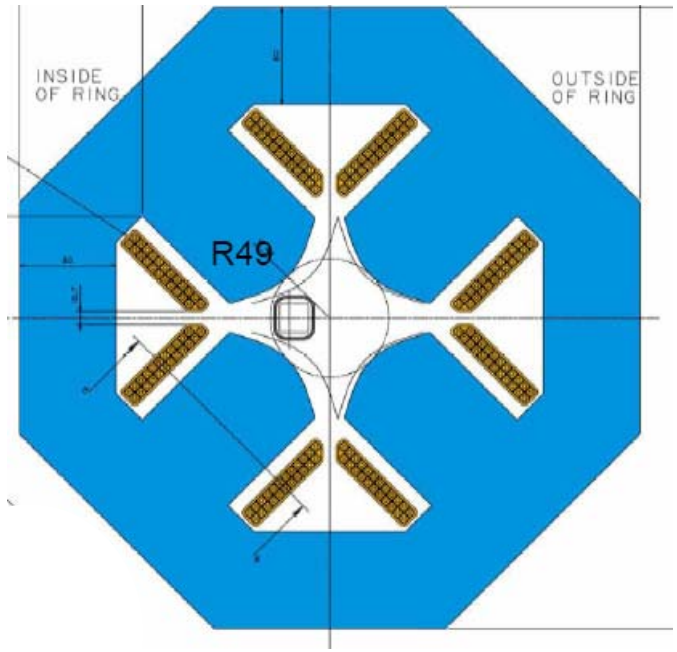
EMMA "Dipole"s + Quads





Pipe apertures:	-21.6 to 20.7	-6.1 to 18.8
Vertical:	17.8	23.4
Shifts:	4.9 to 10.2	28.7 to 48.6

Goal: Study beam dynamics in a non-scaling FFAG machine

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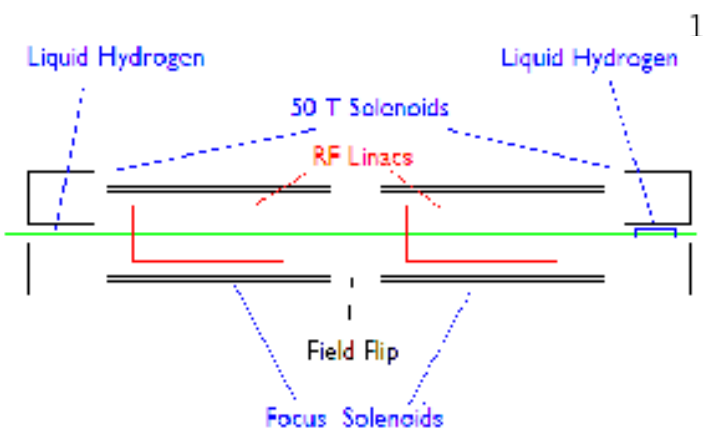
The International Design Study

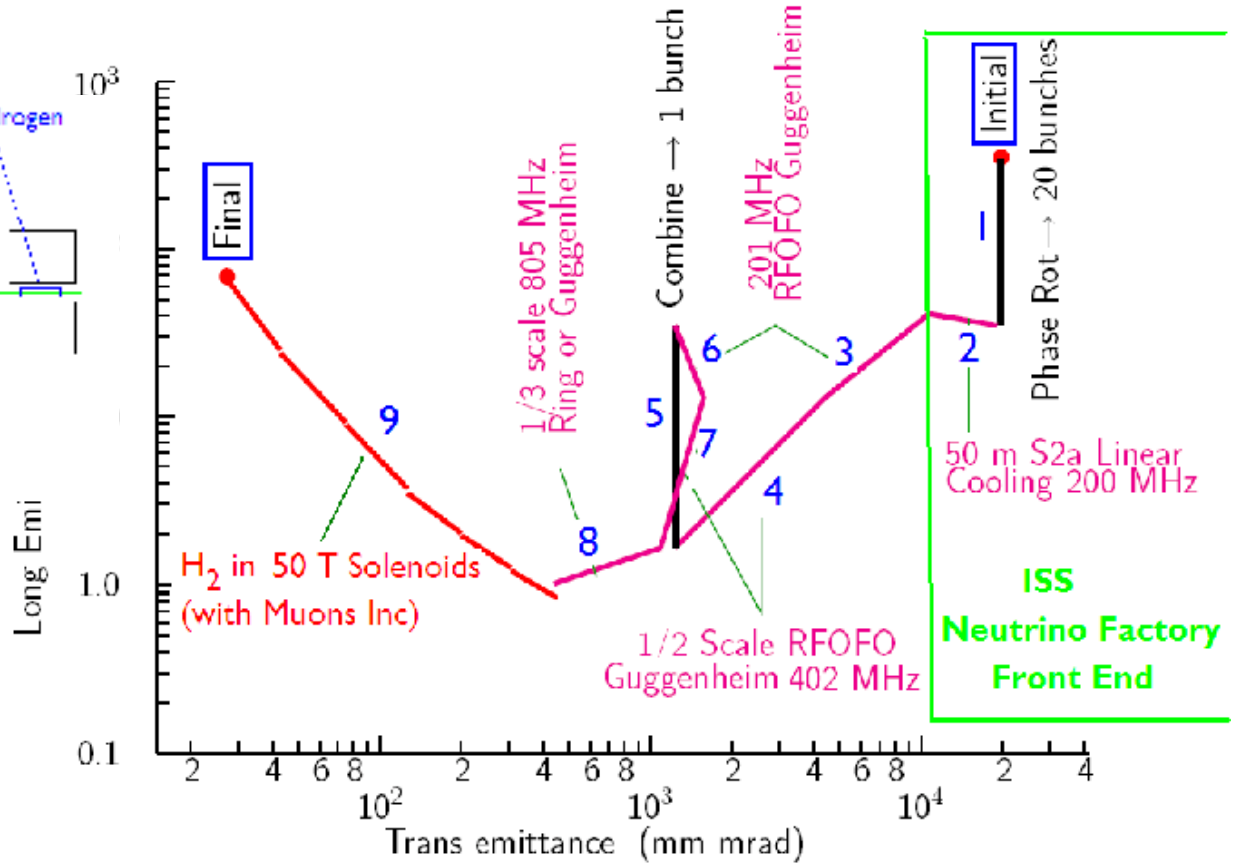
Goal: Unified cost-optimized solution for a Neutrino Factory by 2010 (IDR).
Engineered design by 2012 (RDR).

The International Design Study (IDS) will build on the successful conclusion of the International Scoping Study (ISS) in which an international study team developed a unified set of parameters for a future Neutrino Factory.

The year 2012 is significant in that Europe's LHC debt will be retired by that year.

HTS 50T Solenoid





Enable final cooling for a Muon Collider

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Pb-Bi Eutectic (LBE)

Advantages:

- **Solid at room temperature**
- **High-Z**
- **High boiling point (1670^0C - less cavitation?)**
- **Less toxic than Hg**

Disadvantages:

- **125^0C operating temperature**
- **Polonium production**

Future Plans for NFMCC

- MERIT experiment: Beam in July 2007
- MICE experiment: First Beam Fall 2007
- EMMA project: 2007-2010
- Participate in International Design Study: 2007-2010
  - FFAG studies
  - Storage ring designs
- Collaborate with FNAL MCTF and Muons, Inc: 2007-2010
  - Develop 6D cooling lattices
  - 50T Solenoid R&D
  - 1-2 TeV Acceleration
  - Collider designs