

Other R&D

October 8, 2009

Harold G. Kirk

Target Studies

5-Year Plan

- Simulations
 - MHD simulations
 - Meson production calculations
 - Capture efficiencies
 - Nozzle design
- System Engineering
 - Beam dump design
 - Shielding design
 - CW Hg system
- Component development
 - Nozzle fabrication and testing
 - Hg loop fabrication and testing

Simulations

IDS0NF

Other R&D

A Little History

- Other R&D was also used as a placeholder for high-risk advanced R&D which could impact muon acceleration R&D
- Examples:
 - Development of Liquid Li technology
 - High-efficiency, high-charge acceleration
 - Electron analog model of PIC
 - Ionization Cooling studies in rings
 - Intense bunch acceleration tests

Budget (Other R&D)

FY	M&S	SWF	FTE's
09	200	580	3.5
10	500	1052	6.8
11	500	958	6.6
12	185	425	3.3
Total	1385	3015	20.2

MUTAC: Jet Shape

... the shape and likely also the jet density does not look very reproducible.

MUTAC: Simulations

Comment:

The quality of the 3D **magneto-hydrodynamic simulations** is very impressive and **should be continued** to achieve as much benchmarking with the MERIT experiment as possible. This will then form a better basis for the target design work.

Recommendation

Develop a requirement for the **pulse-to-pulse reproducibility of the pion production rate** and compare with estimates based on the 3D magneto-hydrodynamic simulations.

MUTAC: Beam Dump

Comment:

The beam dump for the 4 MW proton beam inside the superconducting capture solenoid is still an unsolved problem. **This issue requires prompt attention** either within the IDS-NF or the 5-year R&D plan since such **a high power beam dump could be a major cost driver for a neutrino factory or muon collider.**

Recommendation:

Develop a design for a beam dump of the 4 MW proton beam

MUTAC: HTS

Understanding the radiation performance of the HTS could be very useful – if the HTS is radiation hard, it could have broad benefits to the NF/MC design.