AGS Experiment E951

An R&D Program for Targetry and Capture at a Muon Collider Source

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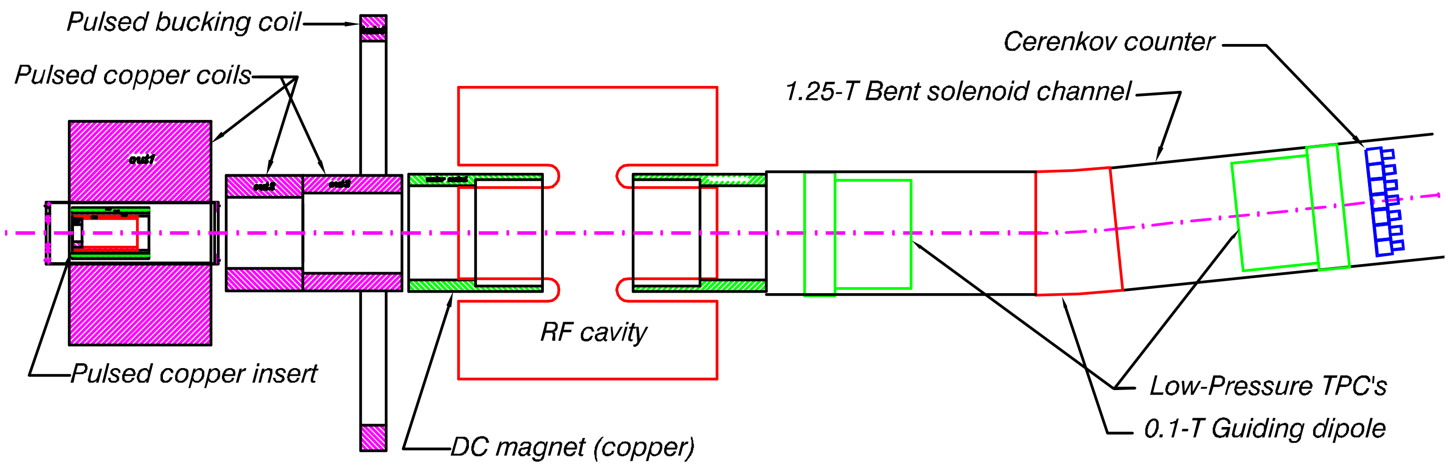

http://puhep1.princeton.edu/mumu/target/

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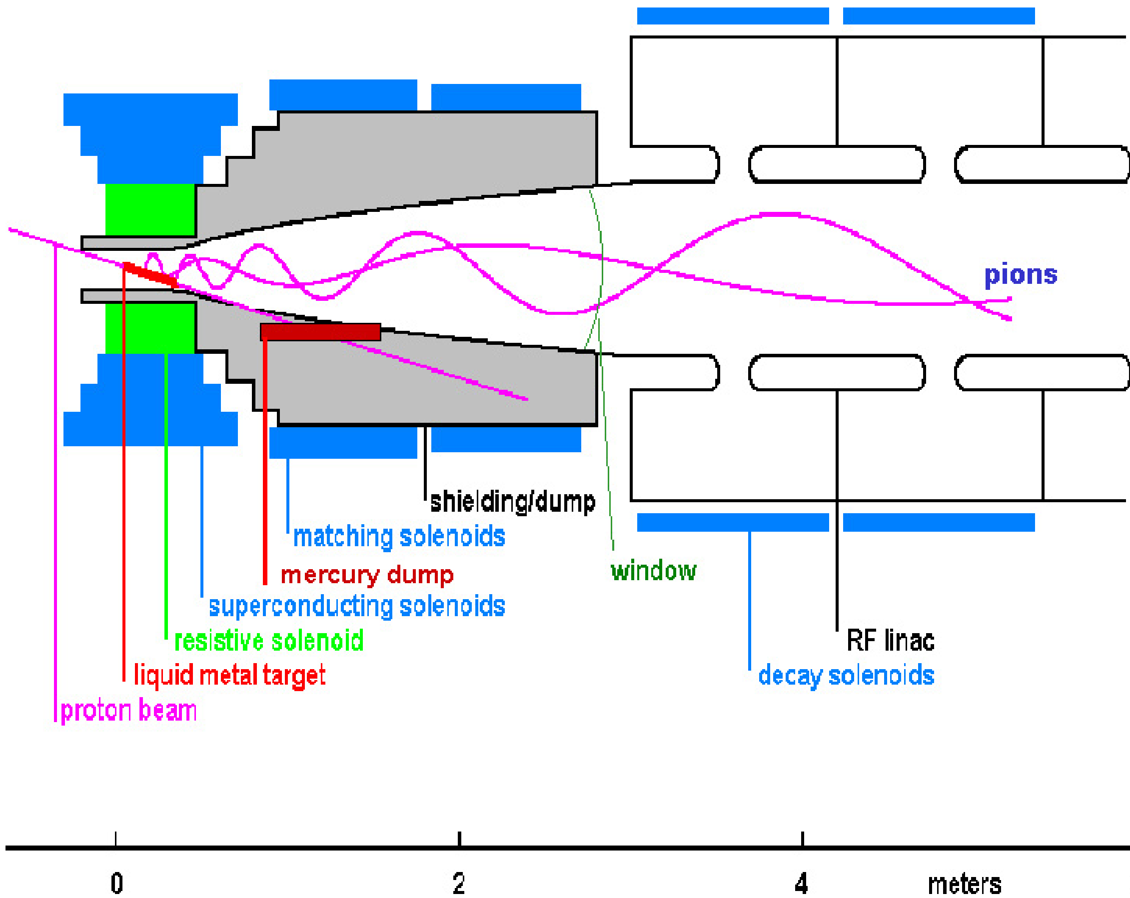
Requirements for Targetry and Capture at a Neutrino Factory/Muon Collider



- 1.2×10^{14} $\mu^{\pm}$/s via π-decay from a 4-MW proton beam.
- Proton pulse $\approx$ 1 ns rms.
- Mercury jet target.
- 20-T capture solenoid followed by a 1.25-T π-decay channel with phase-rotation via rf (to compress energy of the muon bunch).

Two Classes of Issues

1. Viability of targetry and capture for a single pulse.
2. Long-term viability of the system in a high radiation area.

E951 Studies the Single Pulse Issues

Overall Goal: Test key components of the front-end of a neutrino factory in realistic single-pulse beam conditions.

Near Term (1-2 years): Explore viability of a liquid metal jet target in intense, short proton pulses and (separately) in strong magnetic fields.

Mid Term (3-4 years): Add 20-T magnet to beam tests;
Test 70-MHz rf cavity (+ 1.25-T magnet) 3 m from target;
Characterize pion yield.