

Reduced beam running options for E907

- E907 can provide a physicist to work with the beams division people to make the double slow spill work. During the MI shifts needed to make test beam extraction work, the double slow spill scheme can also be made to work. After the test beam extraction works, we estimate an additional handful (<10) MI shifts to make the double slow spill work.
- If however, this fails to happen, for some reason till end of 2003, we have the following running options.

Reduced beam running options for E907

- Summer/fall of 2002- Engineering run- Can work with reduced test beam intensity (1/10 of all MI cycles is a slow spill).
- March 2003- Full E907 installed.
- Intensity is 1/10 of all MI cycles.
- We run for a year in this scenario.
- So instead of 26 data points (in 4.4 months) we can get 6.9 data points in 11.7 months. These we will utilize as follows.

Amount of running time in the reduced beam scenario

H2(scaling) 1.8 data points (3 energies 2 charges)

N2(Atmospheric neutrinos) 1.8 data points. (3 energies 2 charges)

No Oxygen measurement.

Pb (P-A + radiography) 1.8 data points. (3 energies 2 charges)

These points are needed to justify funding by Livermore.

MINOS 1.5 data points. This will give give half the needed MINOS statistics.

Then in Year 2004, we will get the double slow spill and run it till MINOS turn on (Nov 2004). During this period, we will complete the measurements in the proposal. If however, due to unforeseen circumstances we cannot, and we run into NUMI commissioning, we will run the remainder of MINOS target measurements only during this period.

Total amount of running time

1 data point = 3×10^6 events takes 126 hours elapsed time with 1 sec flat-top every 3 secs.

26 data points will take 4.4 months with the rates in the proposal.

With the new Double slow spill (Scheme #11, 1 pure pbar cycle alternating with one double spill), this time increases to 6.0 months.

Target	Physics	Beam Energies	Beam Charges	Factor(3 million events/data point)	data points
Cu	Engineering run	3	2	0.5	3.0
H2	scaling	12	2	1.0	6.0
N2	atm. Neutrinos	3	2	0.5	3.0
O2	atm. neutrinos	3	2	0.5	3.0
Be	p-A	1	1	2.0	2.0
Be	survey	5	2	0.1	1.0
C	survey	5	2	0.1	1.0
Cu	p-A	1	1	2.0	2.0
Cu	survey	5	2	0.1	1.0
Pb	p-A	1	1	2.0	2.0
Pb	survey	5	2	0.1	1.0
Various	Nucl. Scaling	5	2	0.1	1.0
Total					26.0

A MINOS target run after this will require 3.3 data points (10^7) events and is expected to take ~400 hrs. (2003-2004 time frame)