



Particle Rates in the MICE Beam line

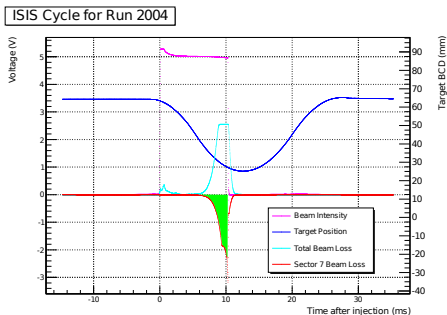
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Beam Loss

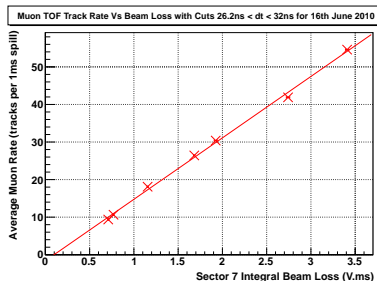
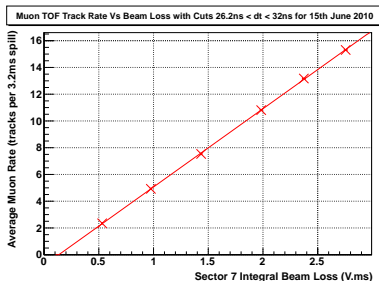
- MICE target located in at start of sector 7 of ISIS \rightarrow look at sector 7 beam loss.
- Two ways of thinking of beam loss - instantaneous and integrated:



Instantaneous in red (V), Integrated in green (V.ms).

Rates and Intergrated Beam Loss

Run averaged particle rates and integrated beam loss track linearly:



Negative $\pi \rightarrow \mu$ transport, 3.2 ms spill gate.

Positive $\pi \rightarrow \mu$ transport, 1 ms spill gate.

Total rates dependant on spill gate width!

Particle Rate Parameters

Particle rate is affected by:

- Target BCD
- Target Delay
- ISIS beam conditions
- MICE beam line optics
- DAQ spill gate width
- DAQ spill gate position
- Material in beam (proton absorbers, etc)

Rates and Optics (the Emittance - Momentum Matrix)

Created by Marco Apollonio. Uses results for 3.2 ms spill gates only.

ϵ_N (mm rad)	μ^- rate (muons/V.ms)			μ^+ rate (muons/V.ms)		
	p_z (MeV/c)			p_z (MeV/c)		
	140	200	240	140	200	240
3	4.1 ± 0.2	6.3 ± 0.2	4.9 ± 0.2	16.8 ± 1.8	33.1 ± 3.2	33.0 ± 2.6
6	4.1 ± 0.4	4.8 ± 0.2	4.5 ± 0.2	17.8 ± 1.8	31.0 ± 2.0	31.7 ± 2.0
10	4.6 ± 0.2	5.4 ± 0.2	4.4 ± 0.1	21.6 ± 2.2	34.0 ± 2.5	26.1 ± 1.5

If we wish a canonical measure of particle rate per unit beam loss, this table should be used.