Muon capture as function of the beam energy
for the ICOOL ST2a lattice
a.k.a. ISS lattice

Simulation

Beam file:

- MARS15 (m1507) code @CERN (version of 21st July 2009).
- Target & beam configuration settings from BNL.
- Field & solenoid position is ST2a configuration.
- Take the muon/pion/kaons at z=0 m from MARS output.
- Smear the particle time by a gaussian of σ = 3 ns (gasdev).
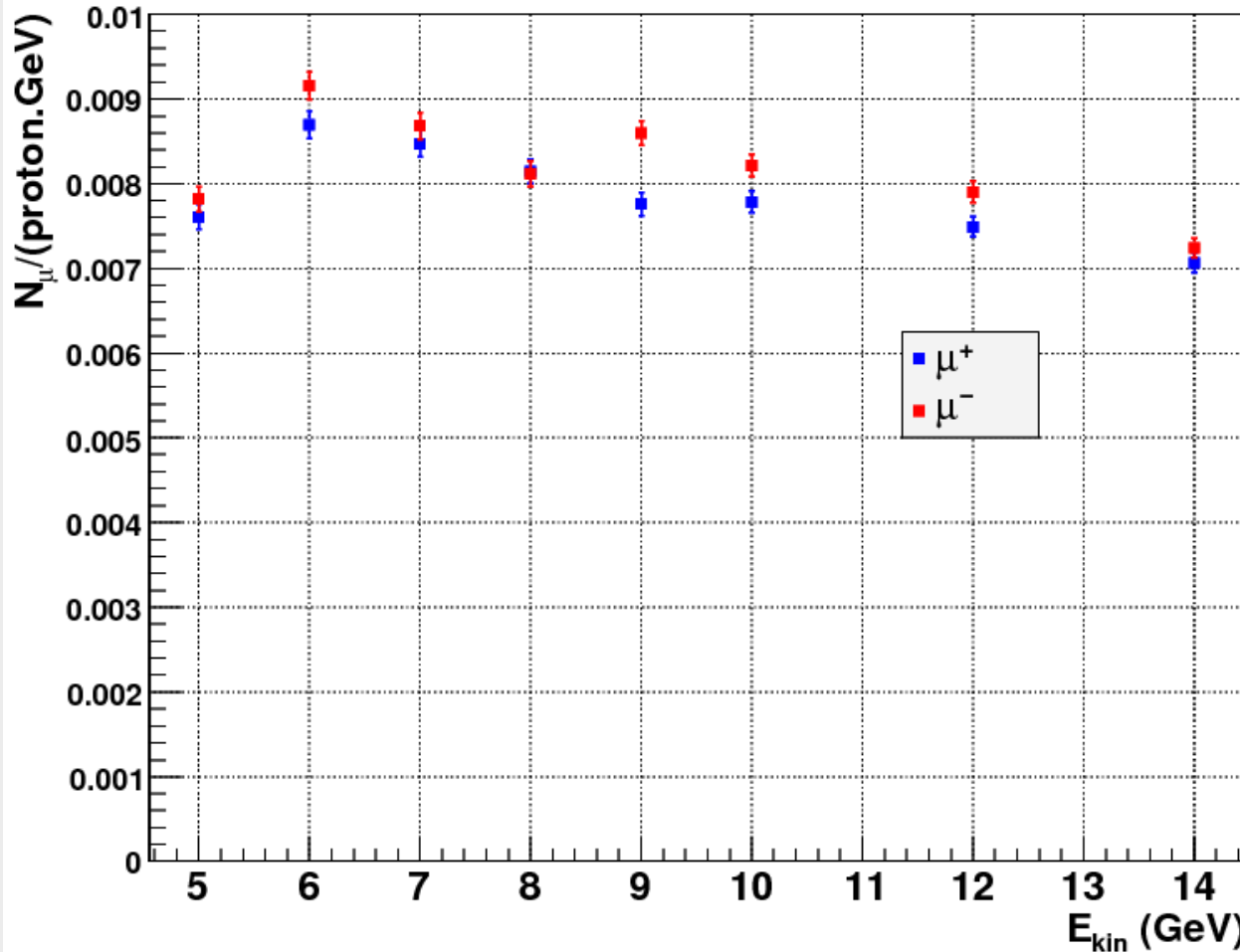
ICOOL deck is the ISS (ST2a deck).

Particles are tracked until the end of the cooling channel.

Acceptance cuts (using ecalc9f):

- $50 < p_z < 400$ MeV/c   tail cutting function on (σ = 4)
- $A_{/\!/}$ = 150 mm   correction for pz-$A_\perp$ correlation on
- $A_\perp$ = 30 mm

Muons yield (16x4h processing)

Muon yield per proton and per GeV within acceptance – ST2a

Error bars:

$$E = \sqrt{\frac{N S_2 - S_1^2}{N-1}}$$

$$S_1 = \sum w_i$$

$$S_2 = \sum w_i^2$$

Dependence in energy more flat than figure of merit @50 m.

Need to check time spread, acceptance cuts, run to run dependence.

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