New Runs in G4Beamline

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Data file

- Particle distribution after target - from Harold Kirk.
- The file header says “Icool Input all positives (negatives) 4x10**5 incoming 8GeV protons p11 June 28, 2010”.
- The following table summarizes the particle content of the beam:

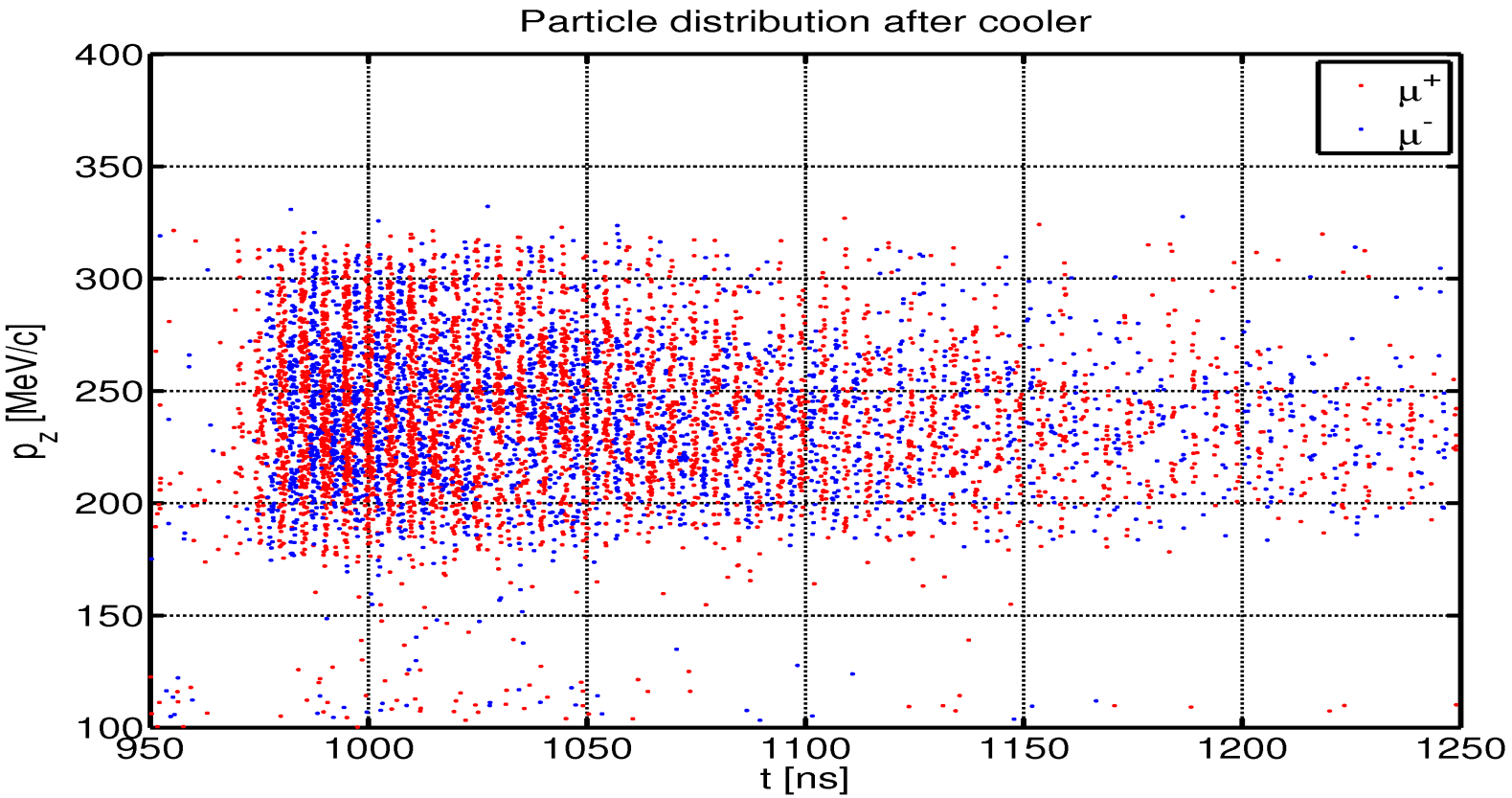
Particle	Count
$p/\bar{p}$	218069/1808
e^-/e^+	46091/43068
π^-/π^+	84140/78889
μ^-/μ^+	9880/10135
K^-/K^+	274/4108
Total:	496462

Simulation setup

- I use π^-/π^+, μ^-/μ^+ and K^-/K^+ for my simulations.
- Total number of protons on target: 400000 (4e5).
- Below is a table summarizing particle yield after different stages in a typical run (decay and stochastics are on).

Stage	μ^+	μ^+/p
After Drift	48201	0.12
After Rotator	49277	0.123
After Cooler	24765	0.062
After Cooler (t>950 ns)	16300	0.041
After Cooler (p>100 & p<400)	17175	0.043

Muon bunches after cooler



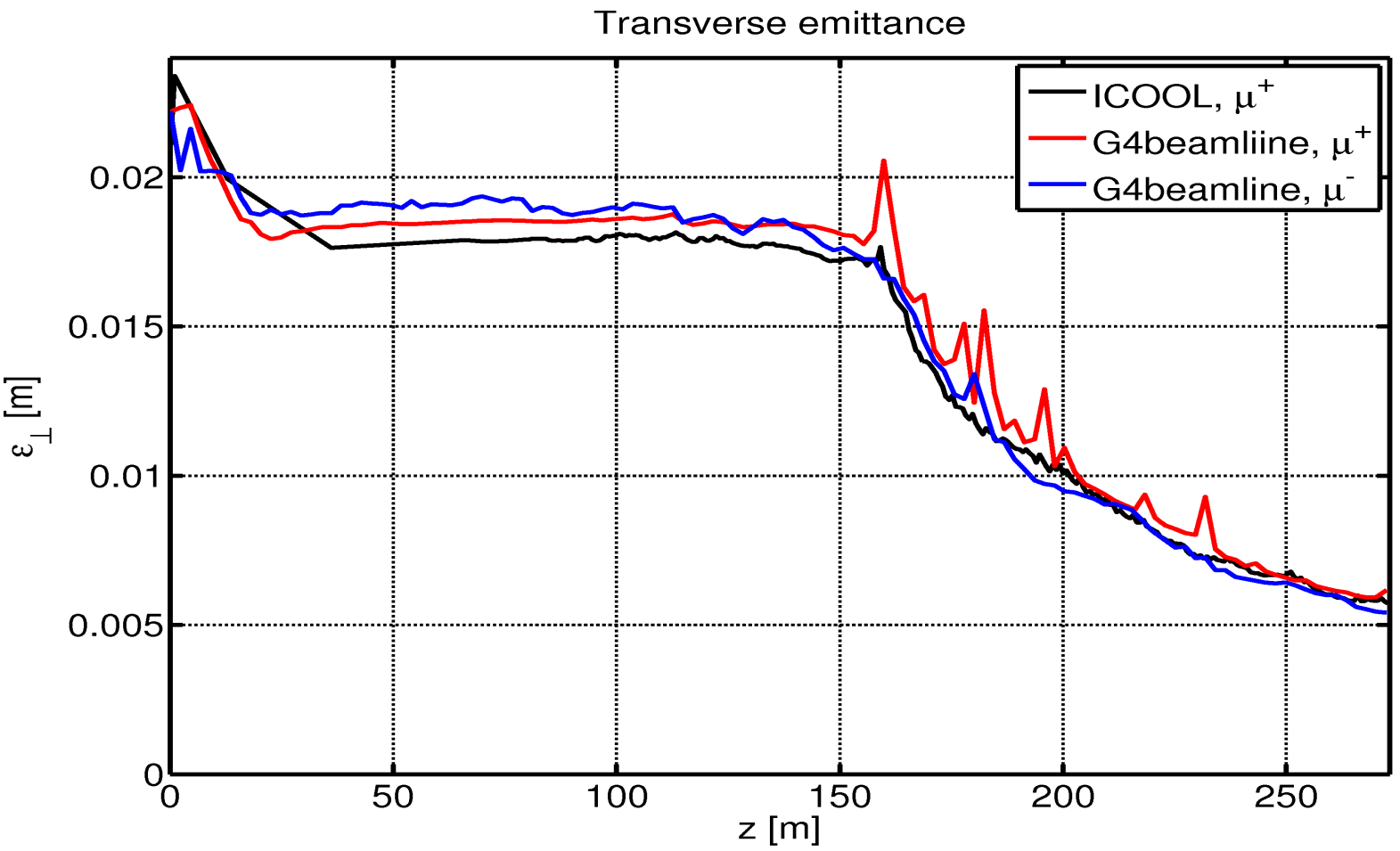
Particle distribution after cooler, baseline frontend lattice, cooler max. gradient = 16 MV/m

ecalc9 settings

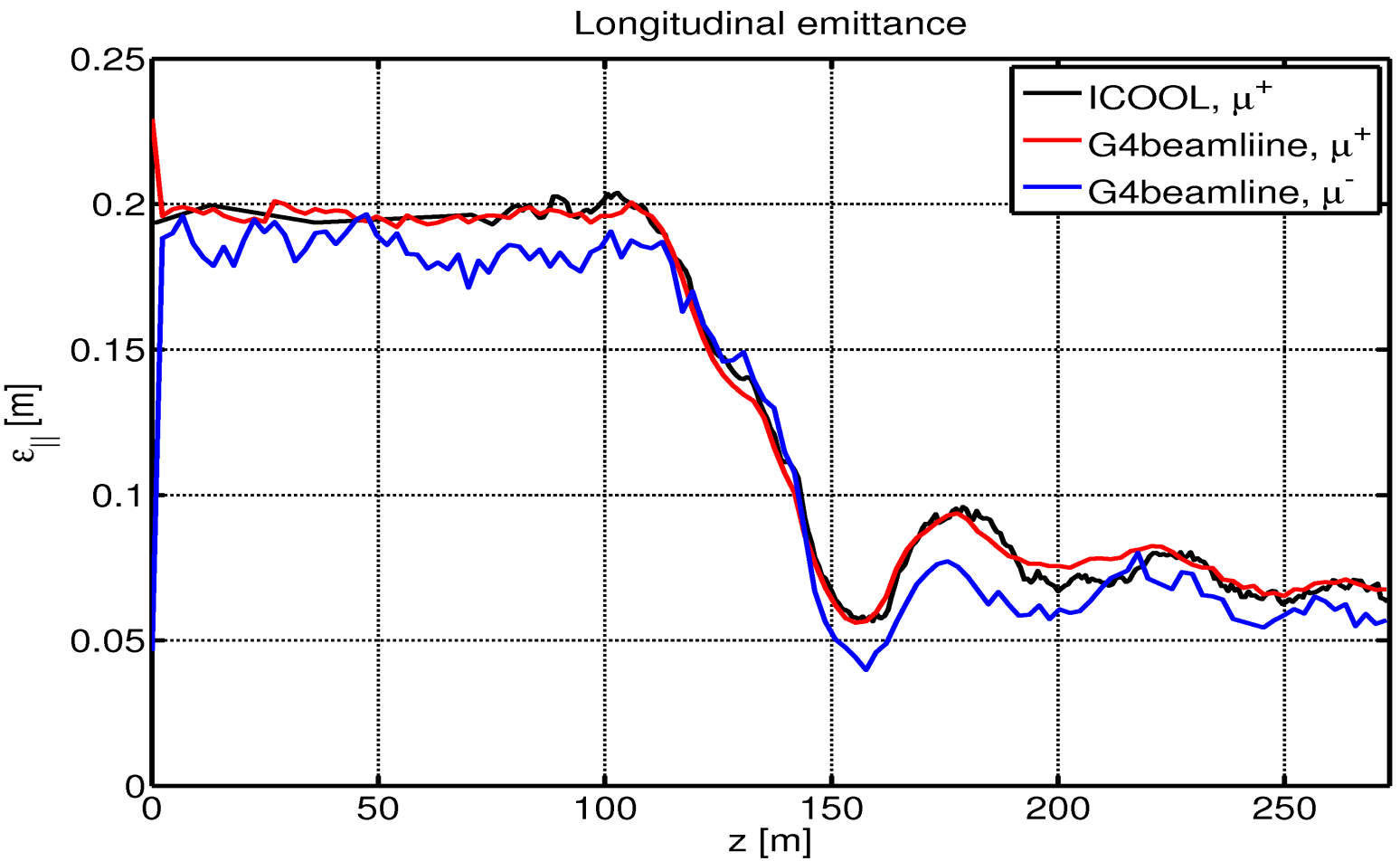
I use the following ecalc9 settings (same as Chris used in ICOOL):

- Particle type: 2 (μ^+) or -2 (μ^-)
- $p_{z_{min}}/p_{z_{max}}$: 0.1/0.3 GeV/c
- transverse cuts: 0.015/0.03 m
- longitudinal cut: 0.15 m
- RF frequency: 201.25 MHz
- sigma cut: 0
- do not subtract out amplitude correlation

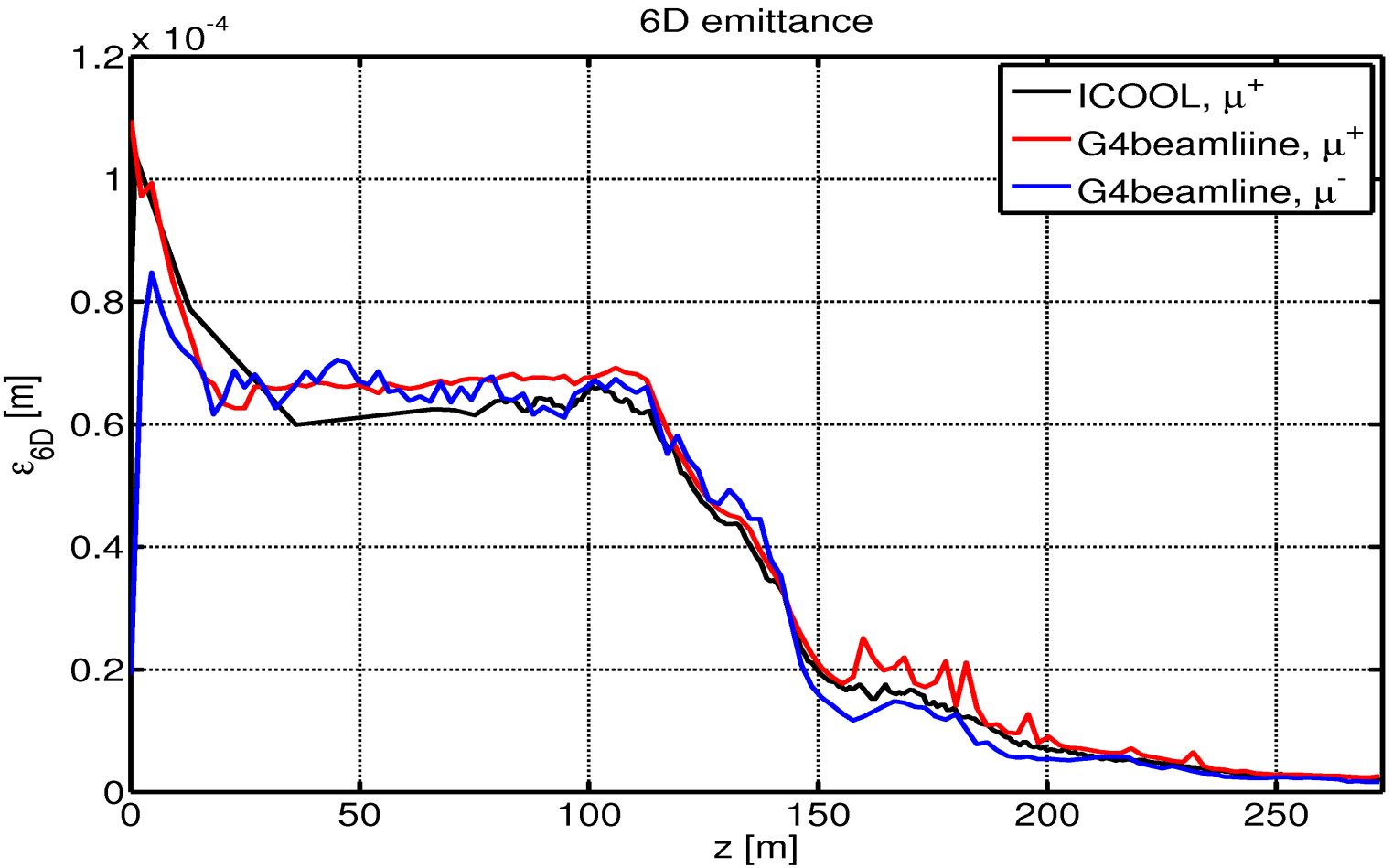
Transverse emittance compared to ICOOL



Longitudinal emittance compared to ICOOL



6D emittance compared to ICOOL



- G4beamline now supports reference particles “immune” to the RF field and absorber material.
- G4beamline 2.0.4 implementing this functionality has not been released yet, there is no tested Linux version.
- Tweaks required to run on cluster under G4beamline 2.0.3 - implementing now.
- I have initial distributions with/without p/$\bar{p}$ for both ICOOL and G4beamline, updated code deck for the baseline lattice, ecalc9 files. Where do we want to put all this (some files are large)?
- Q: What do we do with this G4beamline deck? Do we want to test different possible layouts, or optimize a particular one?