Baseline Update

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Status at IDS meeting

- G4BL/ICOOL chicane + capture had different performance
  - G4BL worse
- Review main differences in performance
- Address the changes to lattice
- Look at performance again
Magnetic Field

\[ B_z [\text{T}] \]

- ICOOL p99s
- G4Beamline
Transverse

- Incorrect handling of chicane aperture
  - Just let particles hit coils
- Mismatch going into cooling section
Longitudinal

- Slight longitudinal mismatch
  - In both ICOOL and G4BL
  - Worse in G4BL
Cooling - Capture Performance

![Graph of ICOOL p99s and G4Beamline transmission in 30 mm vs. z [m]](image)
Revised Lattice

- **Update...**
  - Improved matching coming from field taper
  - Drift uses analytical $B_z=1.5T$
  - Terminate chicane field using field map of solenoid fringe fields and setting current to -1
  - Then use ICOOL field maps etc to do the matching into cooling channel
  - Same reference particle for G4BL/ICOOL (but see below) for calculating RF cavity phases
  - Fixed drift length in G4BL
  - Corrected chicane bending radius factor -1
  - Correct apertures
- I believe the only difference now is field maps in chicane
Solenoid Capture

- Discrepancy in muon number here is 5%
- Number of pions is same
- I believe aperture and field map is the same
Field – Taper

ICOOL
G4BL

bz [T] vs z [m]
Field – Chicane

ICOOL
G4BL
Field – Matching

ICOOL
G4BL
Longitudinal Emittance

- Much better longitudinal agreement
Transverse Emittance

- Better transverse agreement (some noise around chicane in G4BL)
Transmission (in cuts)

- Better rate agreement
  - Still some lower performance in G4BL, presumably due to chicane?
Conclusions

- Tidier, better agreement between codes
- Still some fiddling to do