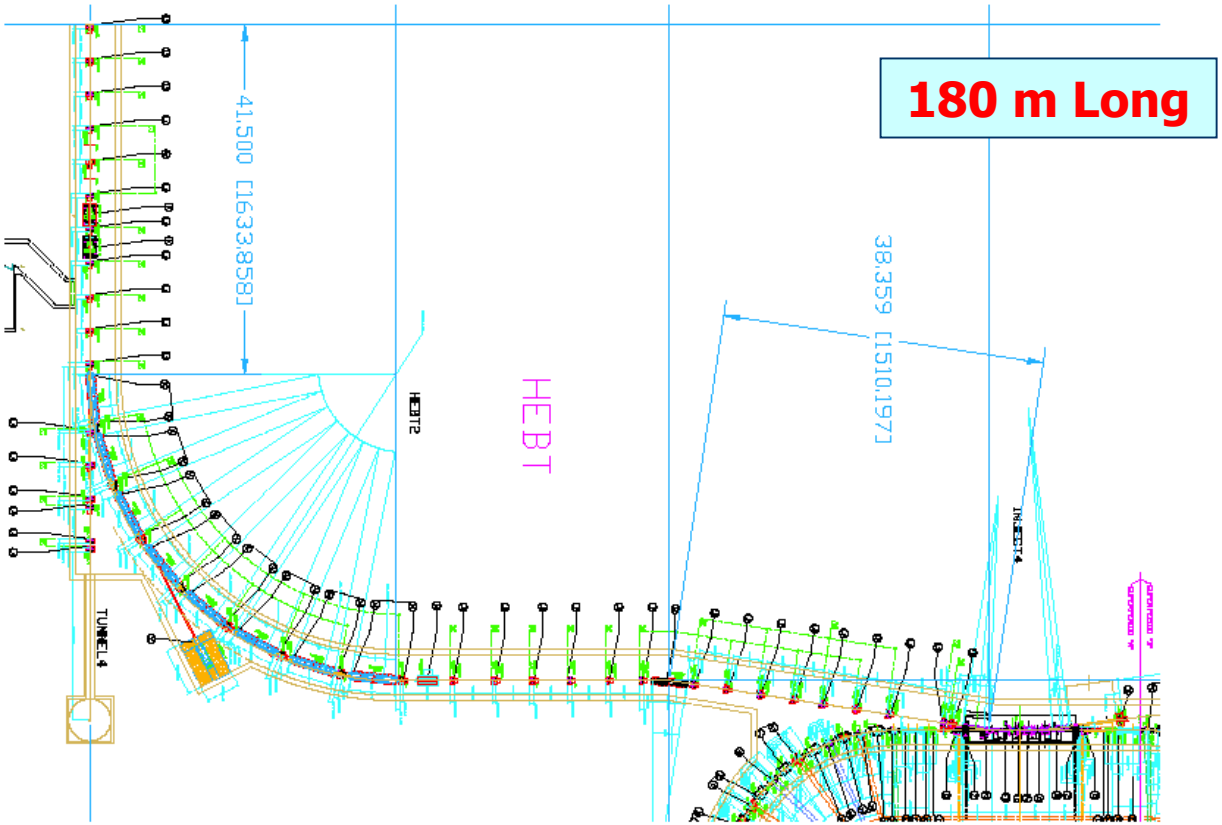
SNS 1 GeV H^- Beam line (HEBT)

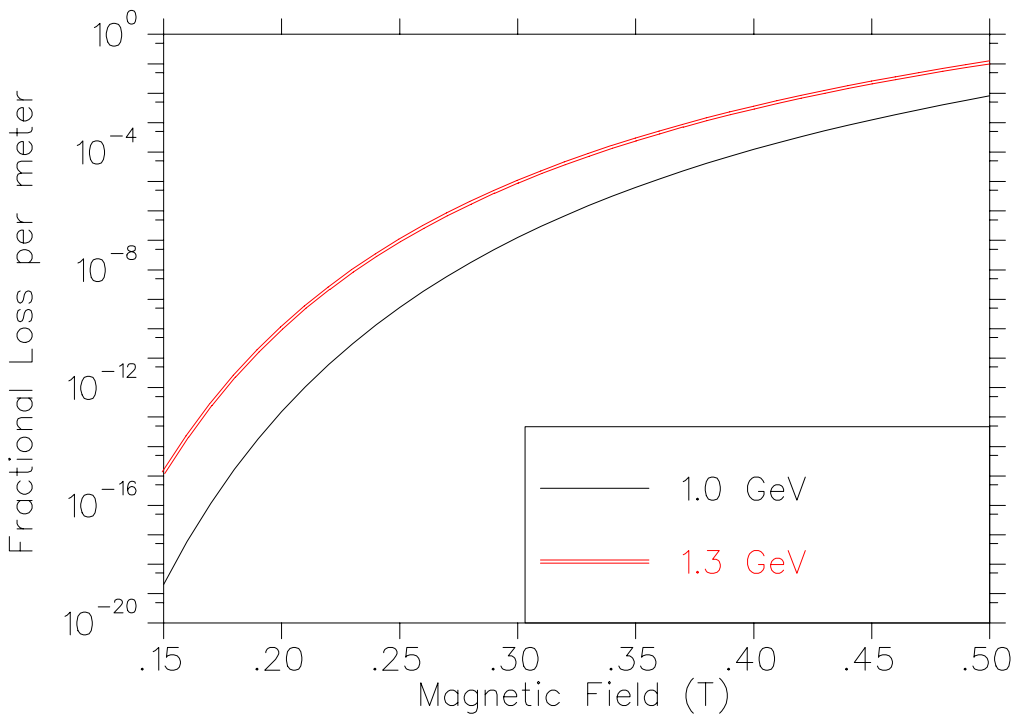
(courtesy: D. Raparia)



Requirements of the 8 GeV H^- Beamline

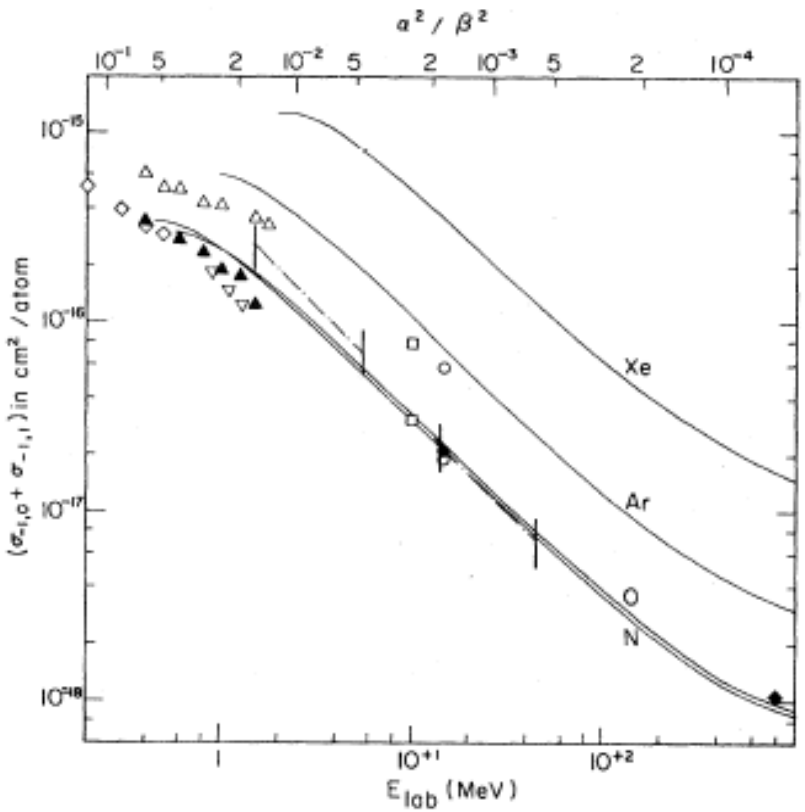
- Transport the H^- ions
  - The dipole and quadrupole field and the vacuum are low enough to control Lorentz and gas stripping
- Optically match the linac and MI
  - Linac–achromat matching section
  - Achromat
  - Achromat-MI matching section
- Correct the energy jitter from the linac (energy corrector cavity)
- Increase the energy spread of the beam (energy spreader cavity)
- Clean the transverse and longitudinal halo
- Characterize the beam from the linac
- Protect MI from fault conditions
- Ratio of aperture to the rms beam size greater than 10 (except energy corrector, spreader and collimators)

H^- Stripping from Magnetic Field



- D. Raparia for SNS: Magnetic stripping 1×10^{-8} per meter

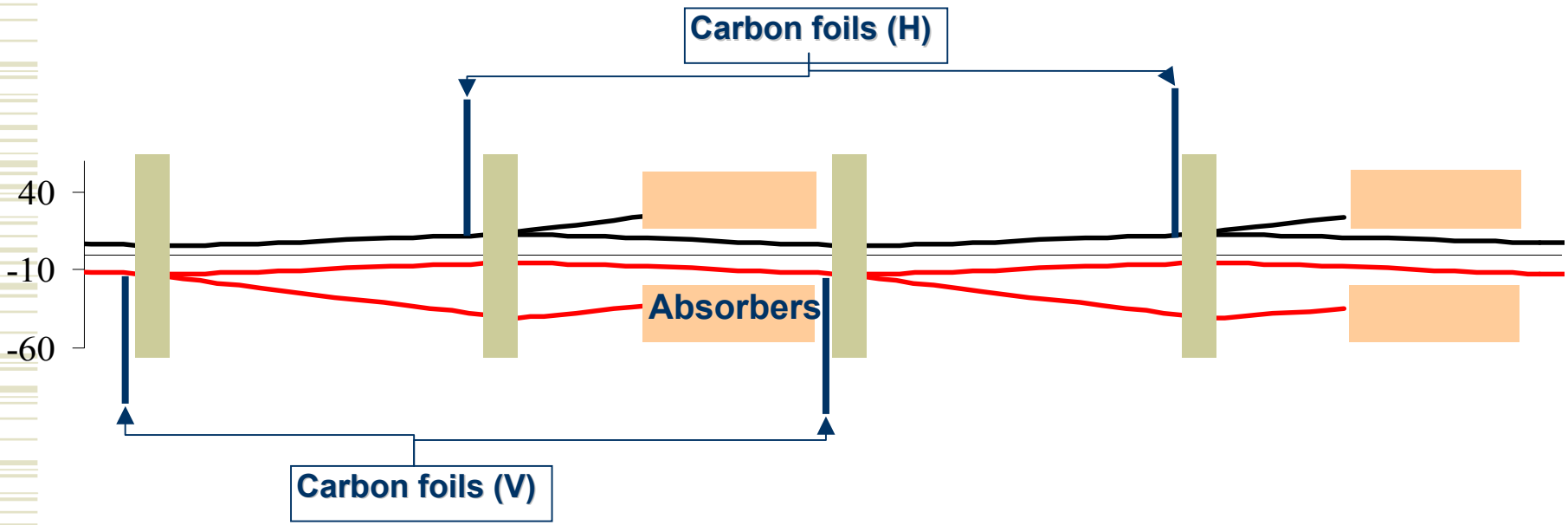
H^- Stripping from Vacuum



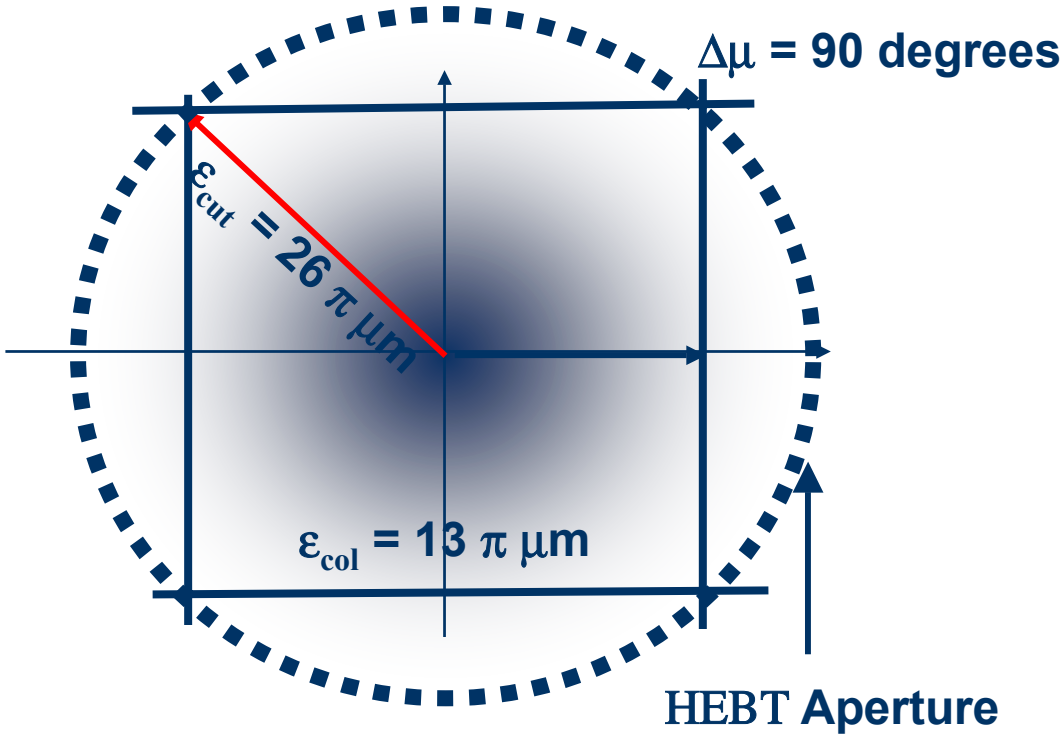
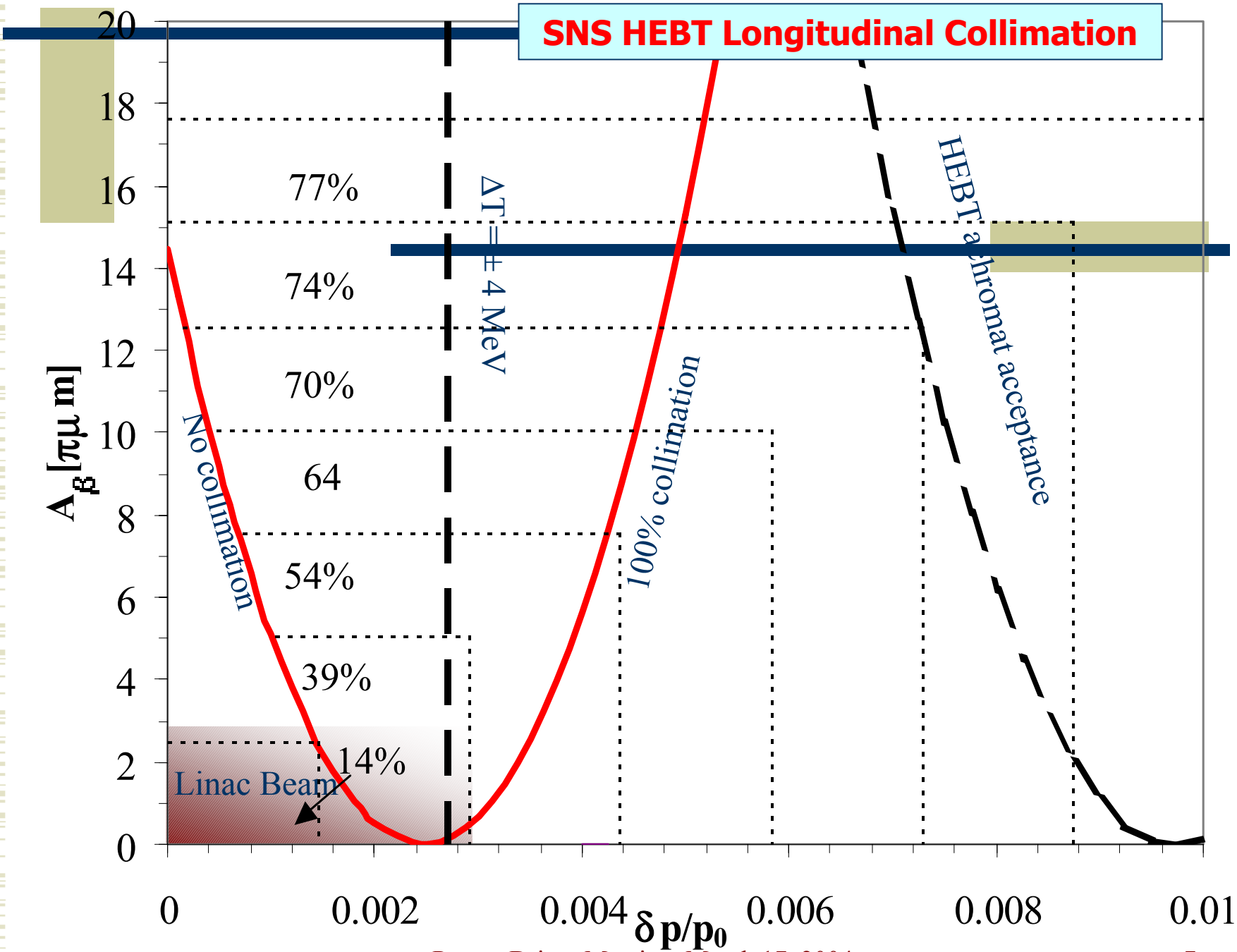
- G.H. Gillespie, Phys. Rev. A, vol.16, p.943 (1977)
- D. Raparia for SNS:

  1 GeV H^-, vacuum 5×10^{-8}, stripping loss 1.6×10^{-7} per meter

SNS HEBT Transverse Collimation



SNS HEBT Transverse Collimation (cont…)



SNS HEBT Longitudinal Collimation