Background Simulation for MAD-2

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Outline

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MAD-2 in GEANT

Geometry

- MAD-1 $\Rightarrow$ MAD-2
- Ideal magnets - 2 quads and a dipole
- Ratio of the fields - from John Lerose
- Shielding

Physics

- Standard physics of GEANT3 - low energy background
- High-X scattering on nuclei (from Z.-E.Meziani and R.Gilman)
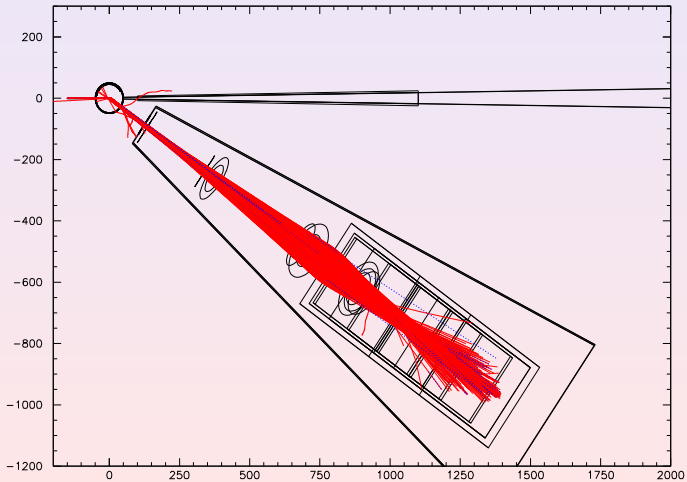- DIS from (Xiaochao, Xin)
- Other

Acceptance

Settings

- Angle $35°$
- Beam 11 GeV/c
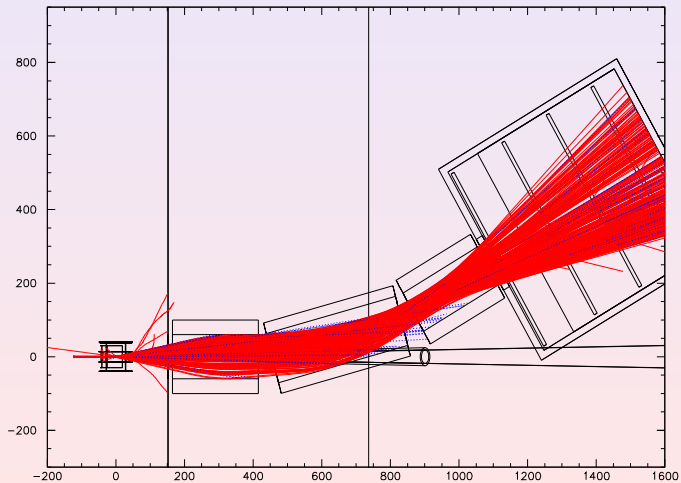- Central momentum 4.57 GeV/c ($\Rightarrow x_B = 1.5$)
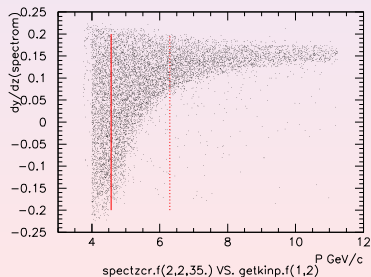
Acceptance

2005/12/01 09.43
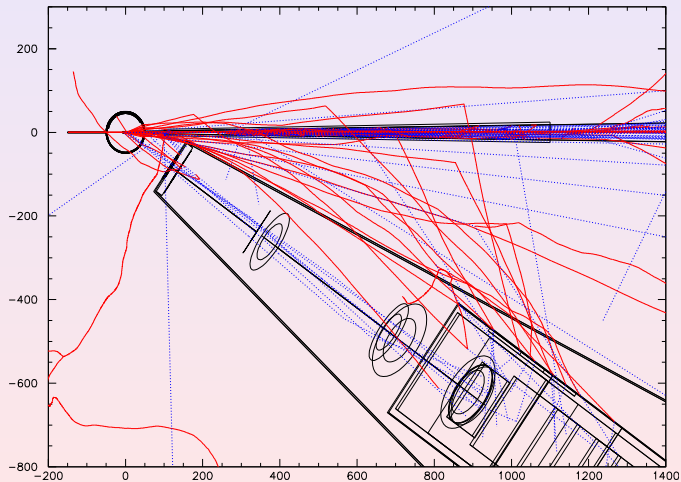
Acceptance
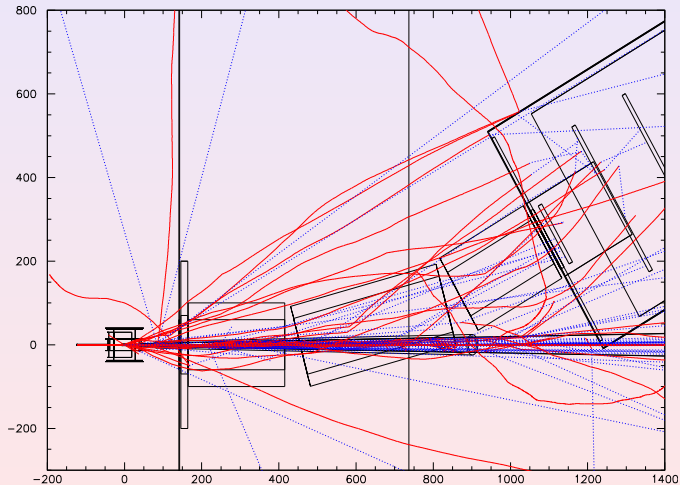
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Acceptance

Settings

- At the central momentum $\varepsilon \approx 19$ mster
- Momentum acceptance $P > P_{central} \cdot (1 - 0.15)$
- For $P_{central} = 8$ GeV/c: $\varepsilon \approx \sim 5$ mster at $P = 11$ GeV/c

spectzcr.f(2,2,35.) VS. getkinp.f(1,2)

Low energy background

Low energy background

Low energy background

Preliminary results: for $35°$, 15 cm LH, 50 μA

- 50 MHz from MAD
- 100 MHz through the detector hut

Shielding used

- Thin detector hut 3 cm of steel
- 4 cm $\times$ 10 m lead shielding around the beam pipe
- 8 cm $\times$ 4 m^2 lead at the front of the detector hut
- 8 cm $\times$ 4 m^2 lead at the side of the detector hut

Possible improvements in shielding

- More shielding at the side of the detector hut
- More shielding around the beam pipe
- Some buffles inside MAD

Outlook

Next

- Improve the shielding
- Implement and check generators for scattering in resonance region and pion production
- Full simulation of physics and backgrounds
  - high X scattering
  - A_n measurements
  - etc