Background studies for Drell-Yan measurements at SPD

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Generation of minimum bias events

- PYTHIA 6
- MSEL=2
- 2 proton beams with E=12 GeV
- Decays of π^{\pm} , K^{\pm} , K^{0}_{L} turned on
- 75-10⁶ events
- $\sigma_{tot} = 39.4 \, mb$
- Only muons produced in volume with L=9 m and D=7 m were taken into account.

Momenta distributions



Dimuon mass distribution



Closest distance of approach



CD — closest distance between mu+ and mu- tracks

VD — distance between point where this closest distance is approached and Z axis

Generation of DY events

- PYTHIA 6
- 2 proton beams with E=12 GeV
- Only process $q \bar{q} \rightarrow \gamma^* \rightarrow \mu^+ \mu^-$
- $m_{\mu\mu} > 1 \, GeV_{\pm}$
- Decays of π^{\pm} , K^{\pm} , K^{0}_{L} turned on
- 10⁵ events
- $\sigma_{tot} = 8.7 \, nb$ (ratio $\sigma_{tot}(MB) / \sigma_{tot}(DY) \approx 4.5 \cdot 10^6$)
- Only muons produced in volume with L=9 m and D=7 m were taken into account.
- (For $m_{\mu\mu} > 4.5 GeV \sigma = 0.03 nb$)

Momenta distributions



Dimuon mass comparison



 $p_{T} > 0.5 \, GeV$

around z axis

MB and DY comparison

dimuon mass



MB and DY comparison

dimuon mass



Conclusion

- Background studies for DY are in progress
- Main source of background is decays of pions and kaons
- Tracking coordinate system with high acceptance and high precision is needed.
- Alternative setup configuration for example, with hadron absorber is to be considered.