# Prospects of diffractive and electromagnetic measurements with ITS upgrade

- Some ideas for measurements with ITS upgrade

    - Standalone in p-p and Pb-Pb collisions

    - In coincidence with very forward tagged proton/heavy-ion

- Bound-free pair production in Pb-Pb collisions

- Alignment issue in p-p collision

Lepton pair production in p-p and Pb-Pb

- very strong electromagn. fields in Pb-Pb collisions at LHC energies
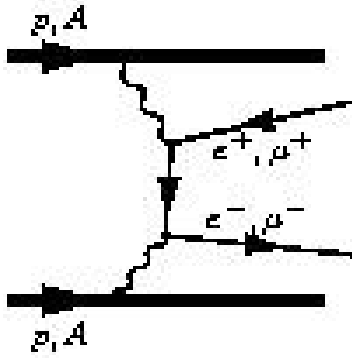
electromagn. production of lepton pairs in p-p and Pb-Pb
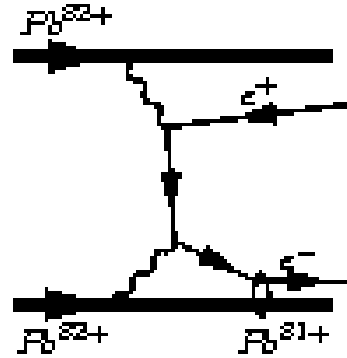
L0 signal from Pb^{81+} after ~ 2 µs under investigation

bound-free pair production in Pb-Pb

$\sigma_{b.-free}$(Pb-Pb, LHC, per beam) ~ 270 b

Rate ~ (540/8) x $Rate_{min.bias}$ ~ 70 x $Rate_{min.bias}$

Q1: can ITS trigger on these events?
   (back-to-back in azimuth)
down to which pT ? variable pT_{min} ?
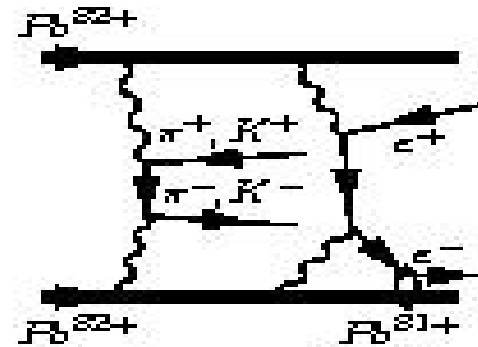
Q2: can ITS be readout with L0 ~ 2 µs ?

Multiple bound-free pair production in Pb-Pb

- multiple (uncorrelated) pair production possible in Pb-Pb collisions
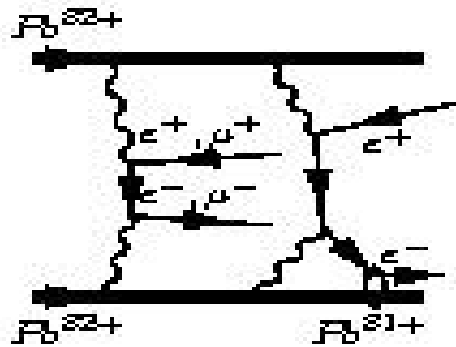
b.-free production plus uncorr.
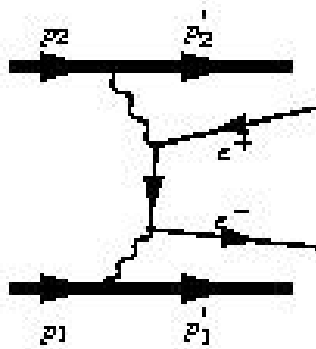*lepton pair production*

Q3: ITS track efficiency at low pT?
(pT < 200 MeV/c, very low mult events)

b.-free production plus uncorr.
pion or kaon pair production

Q4: ITS PID (e,µ,π,K) at low pT ?

Lepton pair production in p-p

- forward tagging of protons with coincidence measurements of leptons pairs useful for study of alignment calibration (study of photon tagging: photon vs pomeron)

$t_1 = (p_1 - p_1')^2$

$t_2 = (p_2 - p_2')^2$

from proton tagging

$(t \sim - p_\perp^2)$

electromagn. production of
electron pairs in p-p

Summary

- ITS trigger on tracks back-to-back in azimuth, variable pT_{min} ?

- ITS readout with L0 ~ 2 µs ?

- ITS track efficiency at low pT?

    - (pT < 200 MeV/c, very low mult events)

- ITS PID at low pT: e,µ,π,K ?