PS e-Cloud Simulations

Non-Standard Charge Distributions-II

Some Issues in ECLOUD code

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e-cloud simulation meeting

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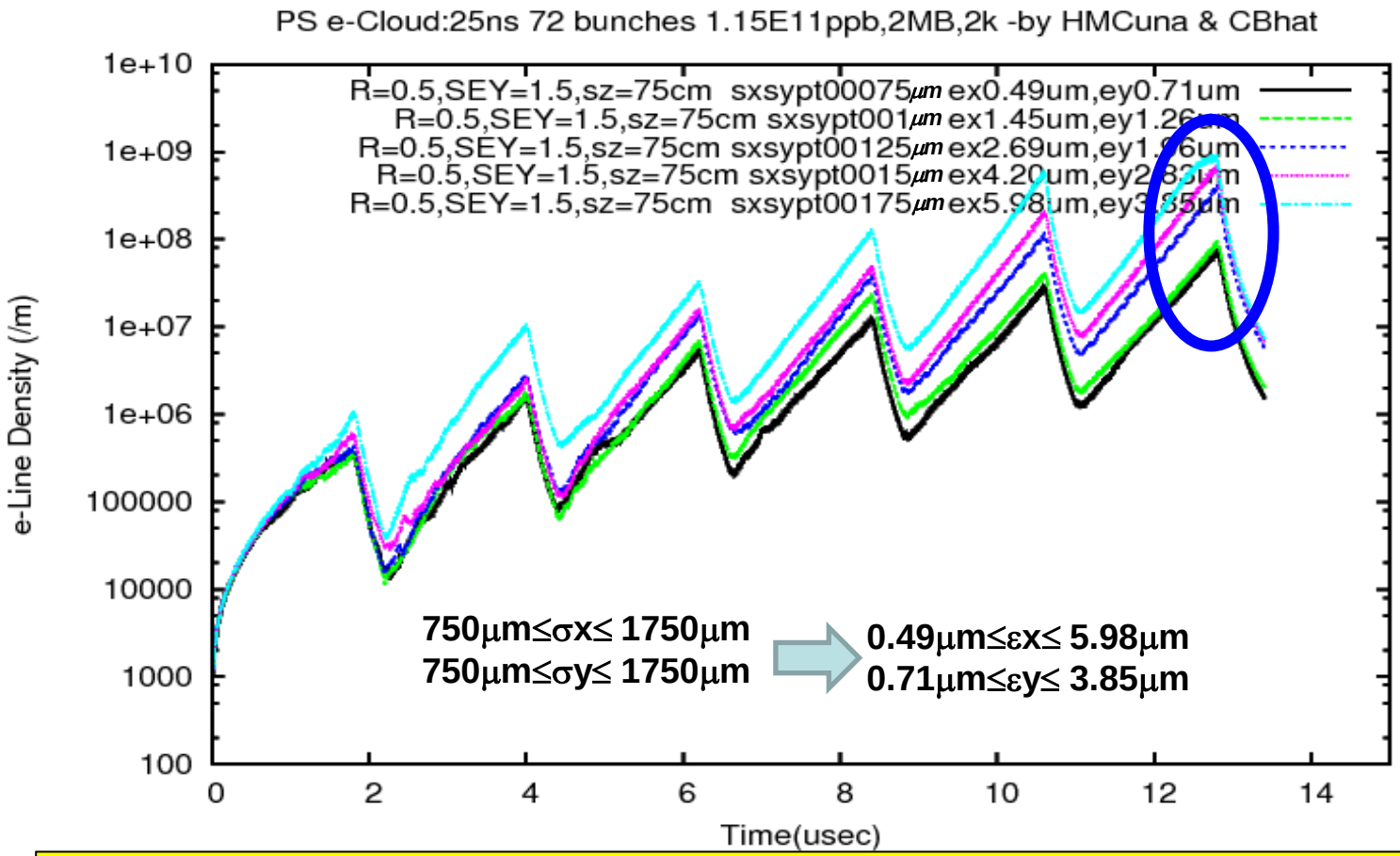
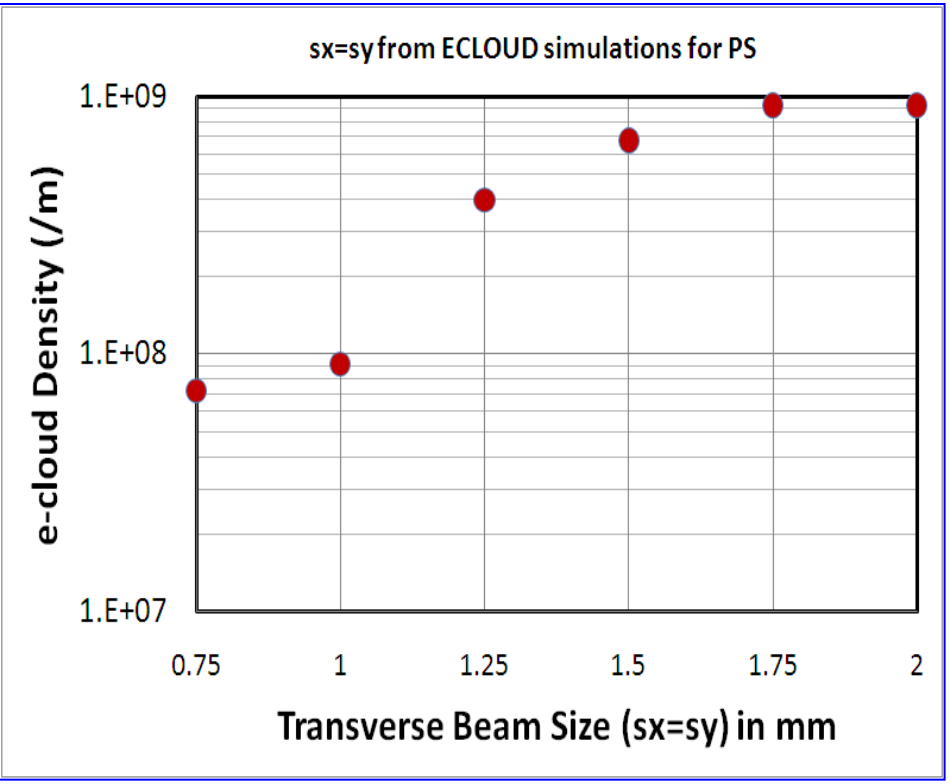
Searching for Saturation in the PS
$\sigma x = \sigma y$ in the range of 750-1750μm



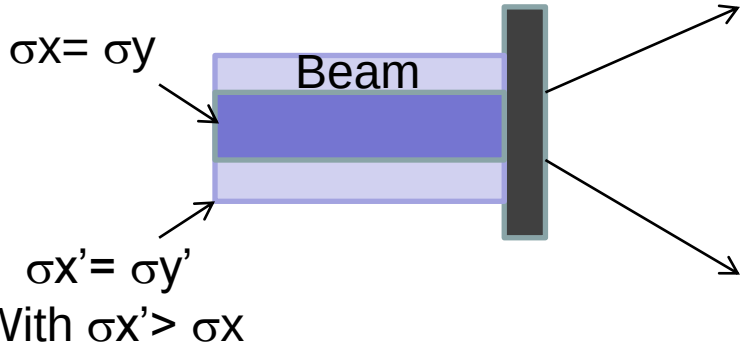
Preliminary simulation results presented on 27/06/2011 indicated that the e-cloud buildup in the PS has a dependence on transverse beam size which is in contrast to the studies done on LHC in the past

Transverse beam size Dependence of e-cloud Density



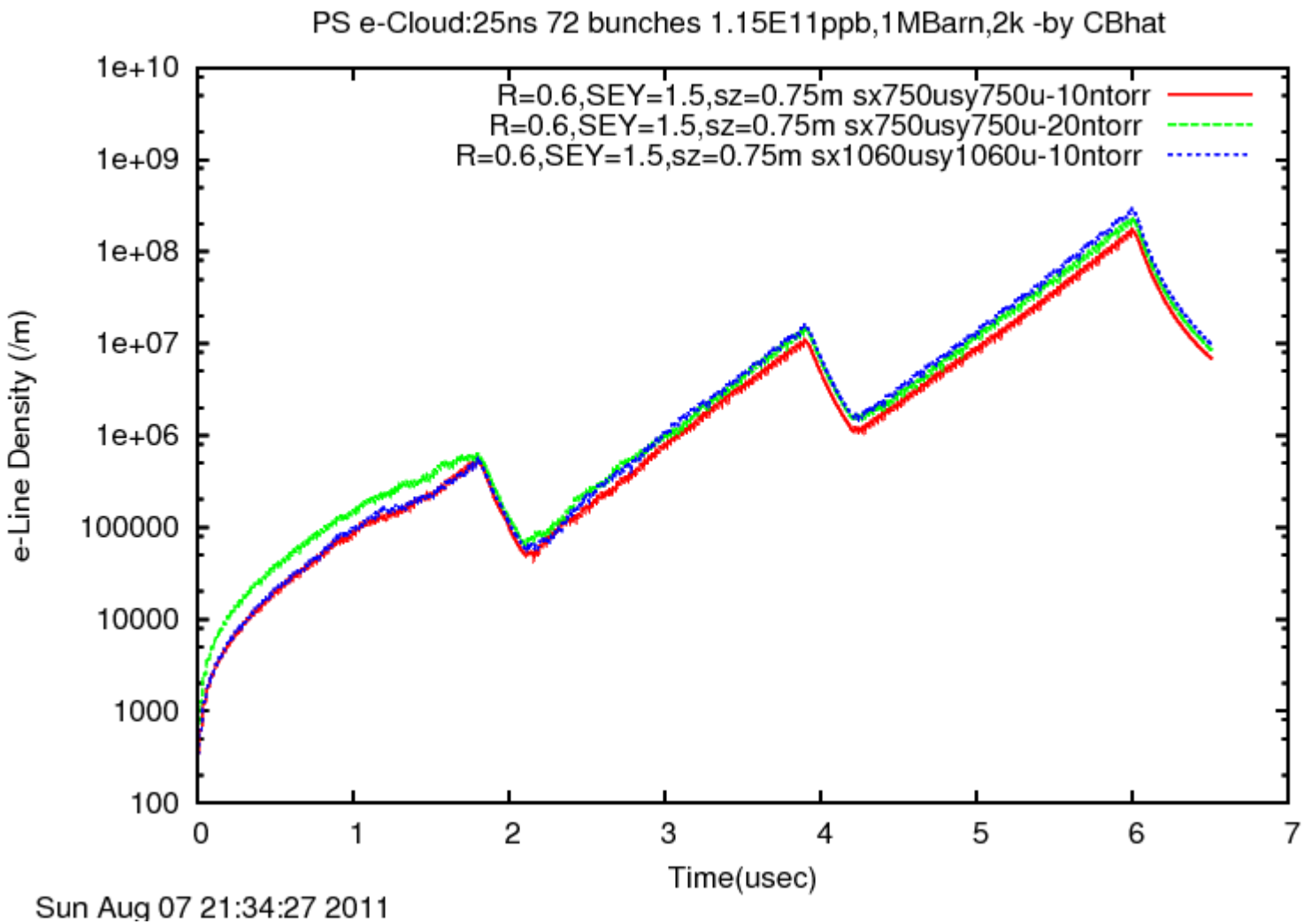
- In the PS the primary electrons are produced by ionization(simple model)

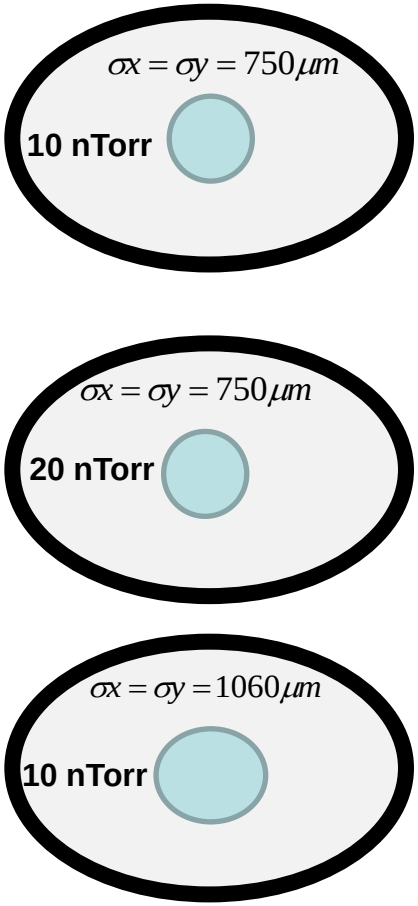
$$N_{primary} = \sigma_{Ionization} \times I_{Beam} \times N_{atoms/cm^2}$$



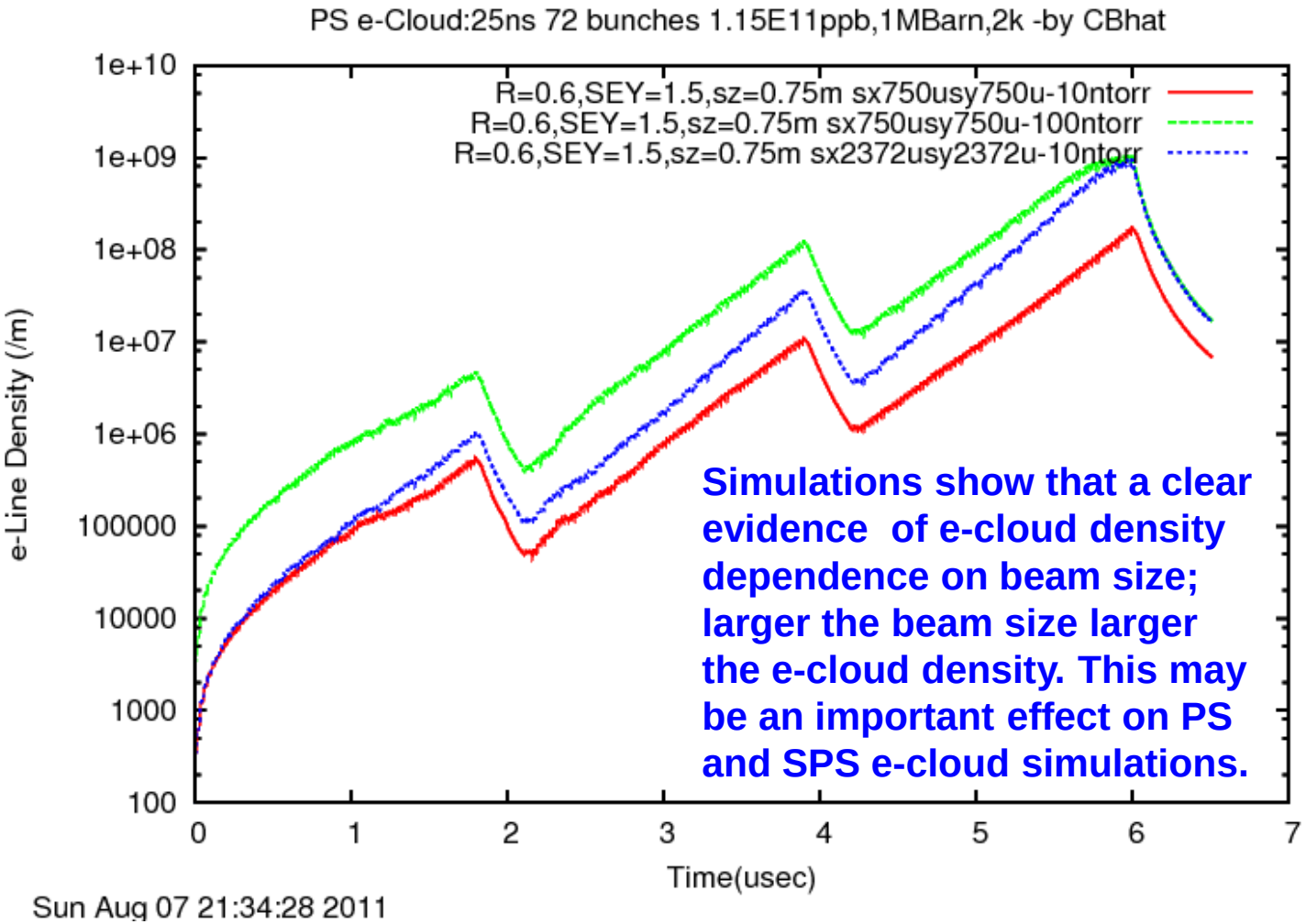
$N_{primary}$ should not change! However, e-cloud evolution is nonlinear phenomenon.

PS ECLOUD Simulations with different σx= σy and Pressures nbstp=200 (&150) nistep=3000 (&2000)

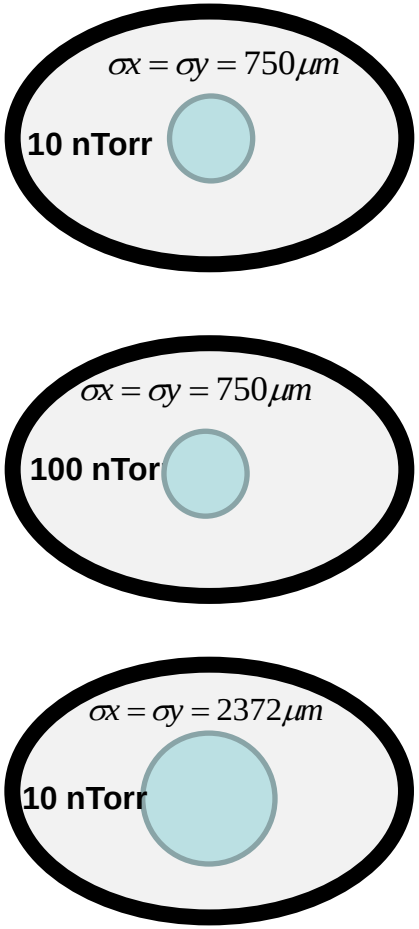




PS ECLOUD Simulations with different σx= σy and Pressures nbstp=200 (&150) nistep=3000 (&2000)



Simulations show that a clear evidence of e-cloud density dependence on beam size; larger the beam size larger the e-cloud density. This may be an important effect on PS and SPS e-cloud simulations.



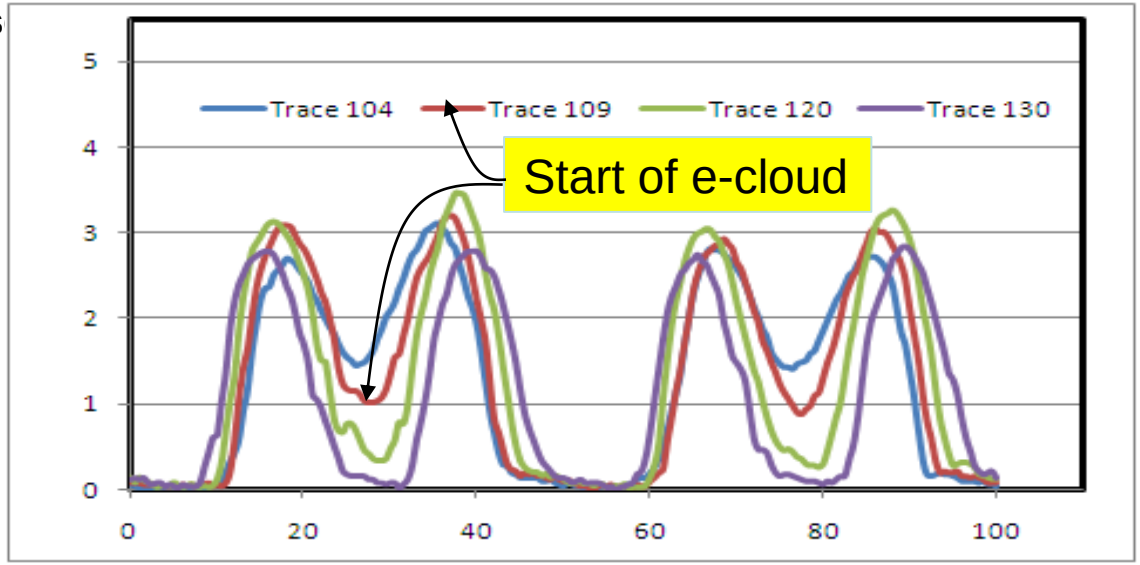
PS e-cloud Data Analysis

PS Bunch Profiles: LHC25

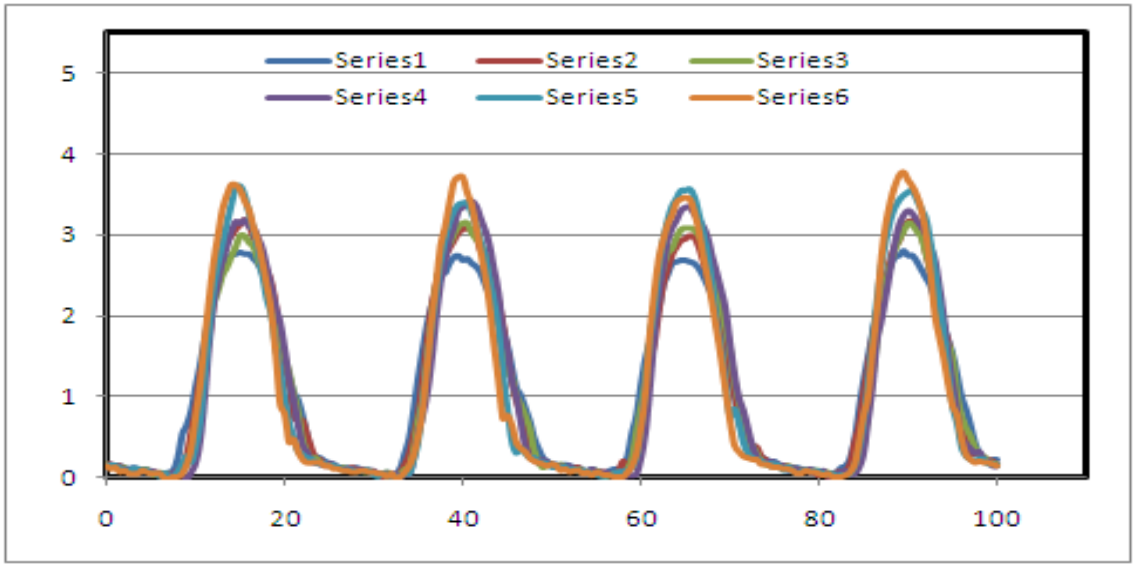
(Non-Standard Charge Distributions)

Bunch Int.= 1.36E11ppb
(1% less than BLM cas

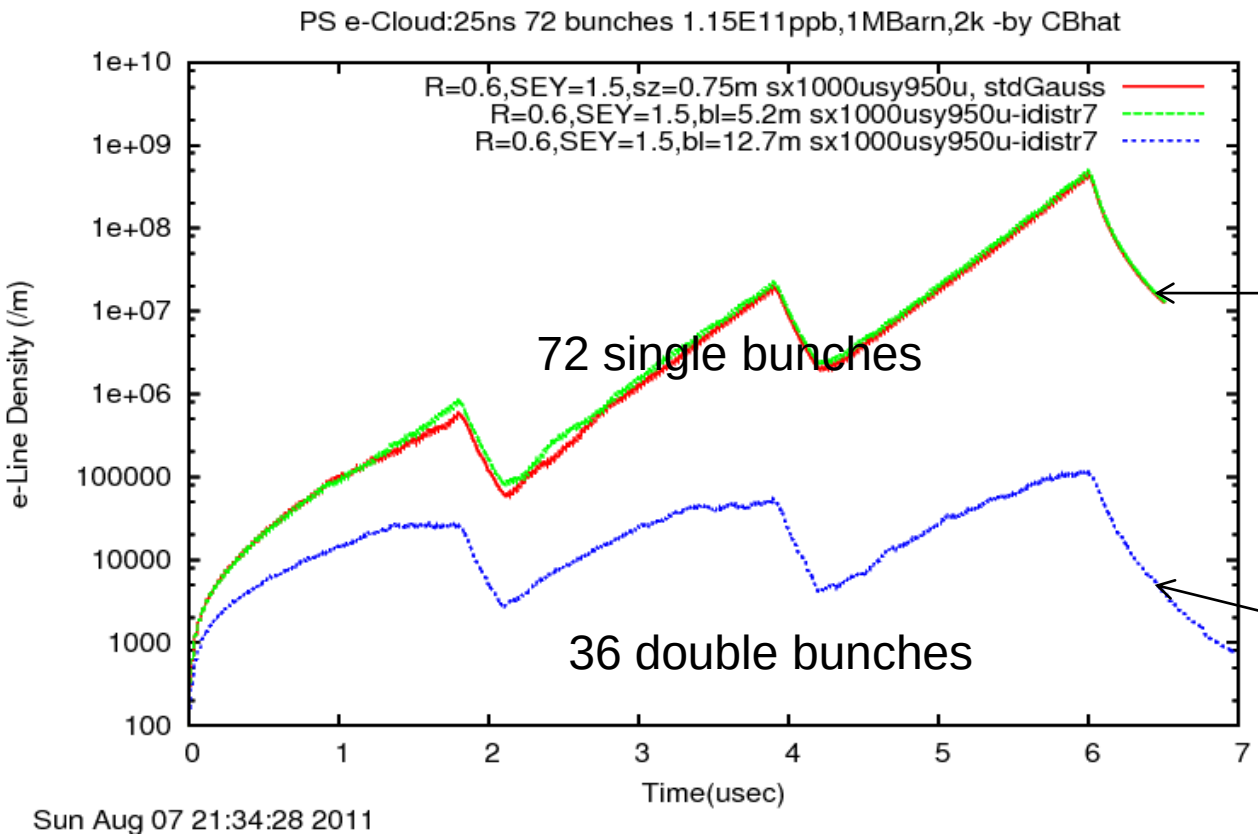
Bunch Profiles during the splitting



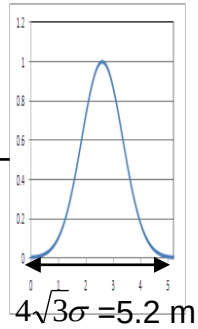
Bunch Profiles for V2/V1= 0
V1=40kV to 100kV

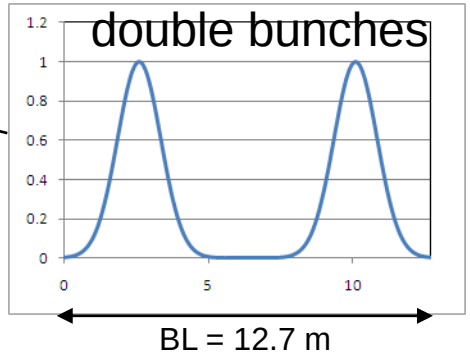


PS ECLOUD Simulations for the PS e-cloud data



single bunch





We find that

"#of partition/bunch < # of inter bunch partitions"

is a necessary condition for ECLOUD. So an improvement is needed.