



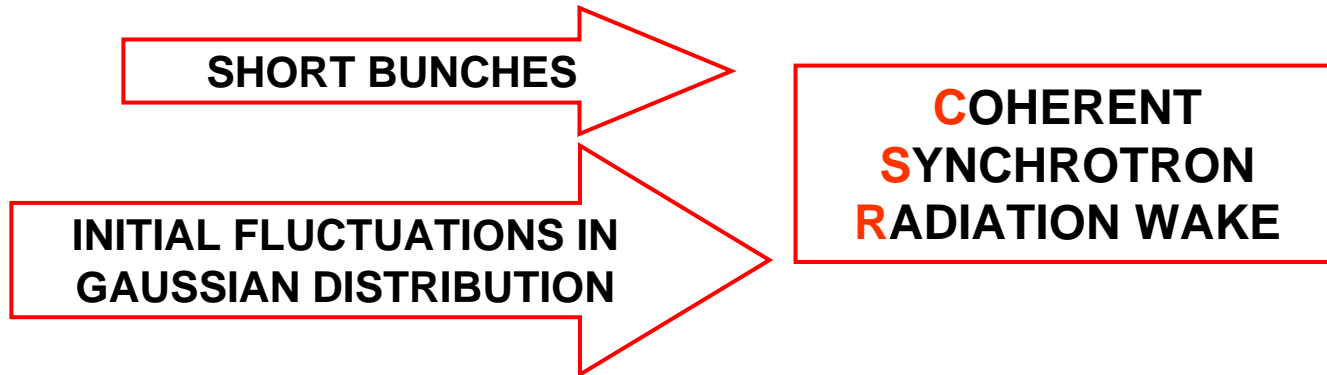
# INFLUENCE OF COHERENT SYNCHROTRON RADIATION ON LONGITUDINAL DYNAMICS

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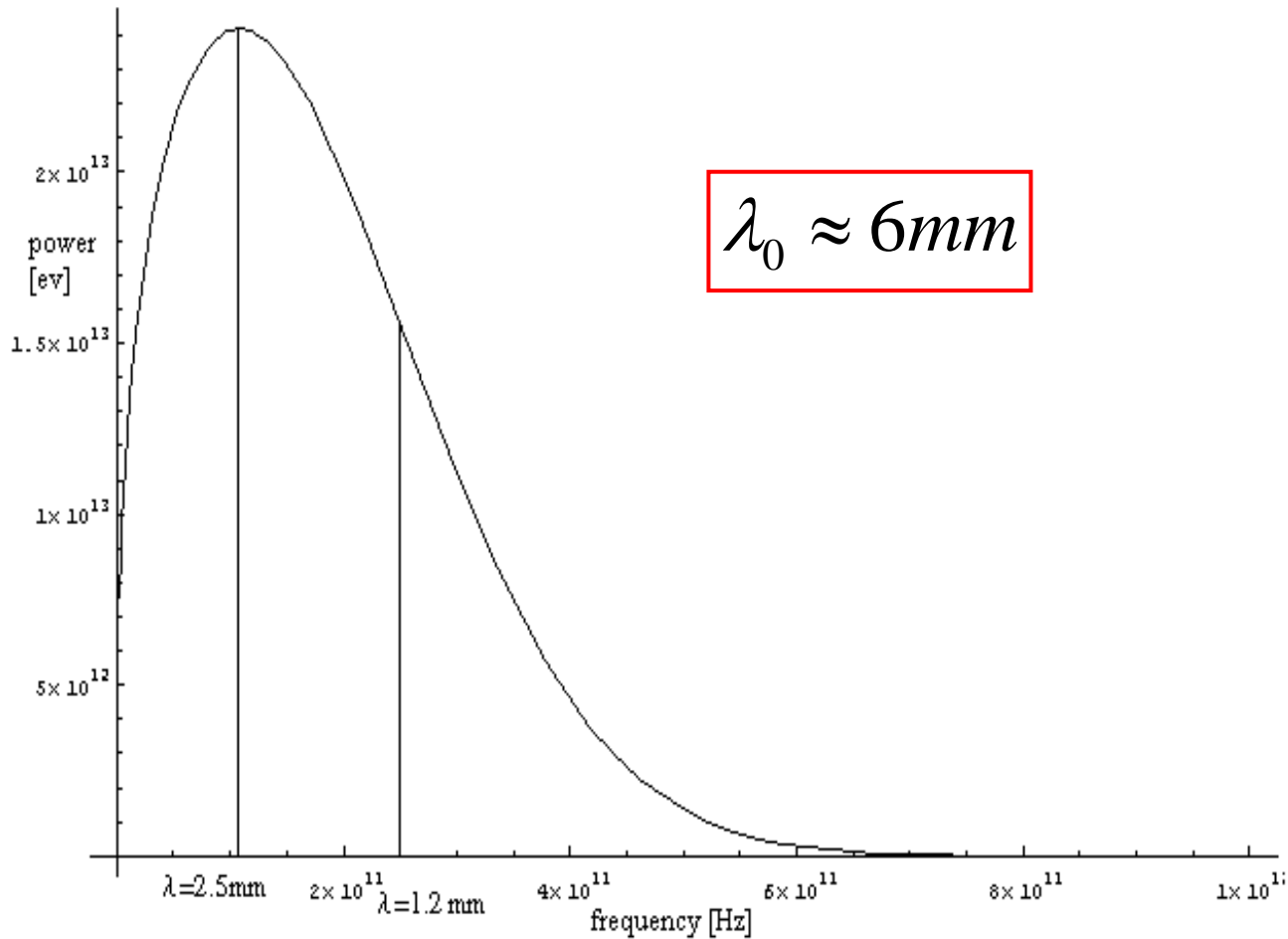
# INTRODUCTION

$$P(\lambda) = \underbrace{NP_e(\lambda)}_{\text{incoherent}} + \underbrace{N^2 P_e(\lambda) \left| \int_{-\infty}^{+\infty} \frac{1}{N} \Lambda(z) e^{\frac{iz}{\lambda}} dz \right|^2}_{\text{coherent}}$$

$$\lambda_0 \approx 2h \left( \frac{h}{R} \right)^{1/2}$$



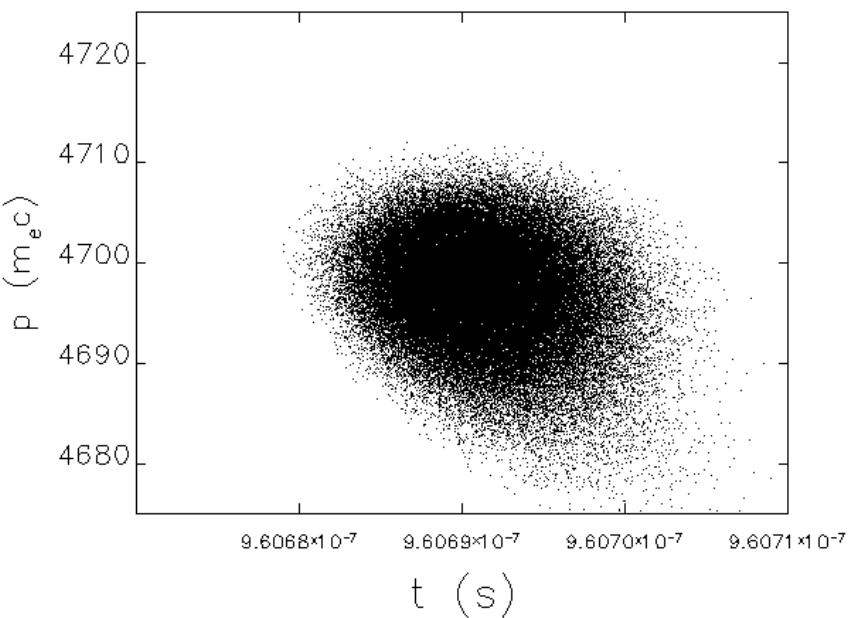
# THEORETICAL CALCULATION



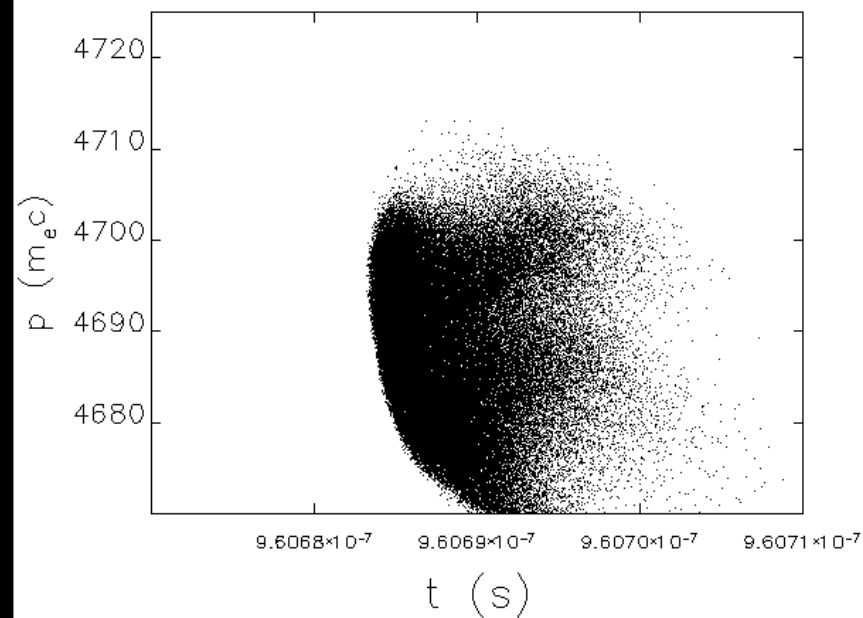
**CSR OF A DIPOLE IN SLS STORAGE RING**

N	$10^{10}$
$\gamma$	4700
L	288m
$\sigma_e$	$8.6 \cdot 10^{-4}$
h	480
$\alpha$	$5.3 \cdot 10^{-5}$
$U_m$	2.1Mev/m
$E_0$	2400Mev
$\rho$	5.7m
$\sigma_z$	1.2mm

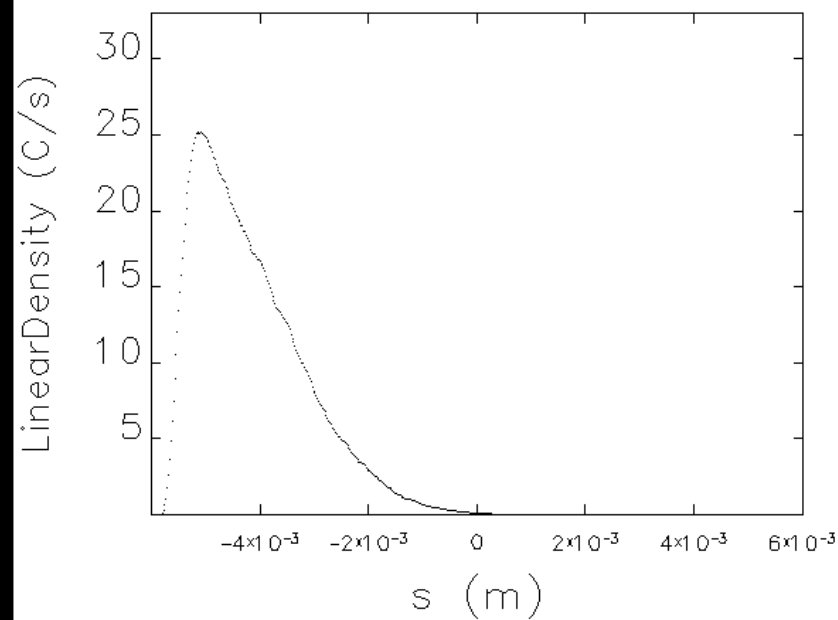
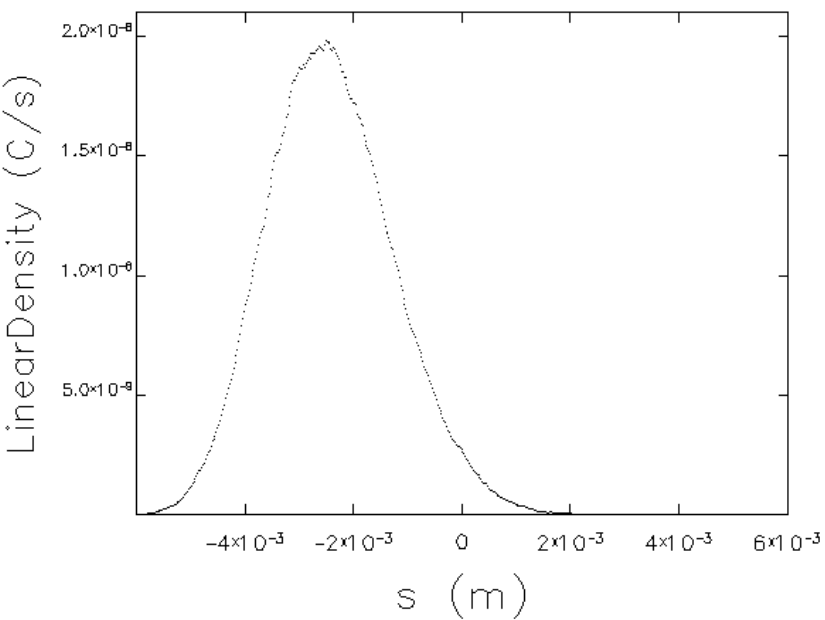
**SLS STORAGE RING  
PARAMETERS**



watch-point phase space—input burstele lattice: sls\_r1\_iso9\_19.39\_10.73(tracy).lat



watch-point phase space—input burstele lattice: sls\_r1\_iso9\_19.39\_10.73(tracy).lat



# NEXT STEPS

- Find out why we have a phase space distortion in very low charge case.
- Proceed numerical investigation of coherent synchrotron radiation influences.
- Investigate a theory of non gaussian bunch CSR wake influence in longitudinal dynamics.