

Updated electron-cloud simulations for LHC arcs

Frank Zimmermann, 18.02.2005

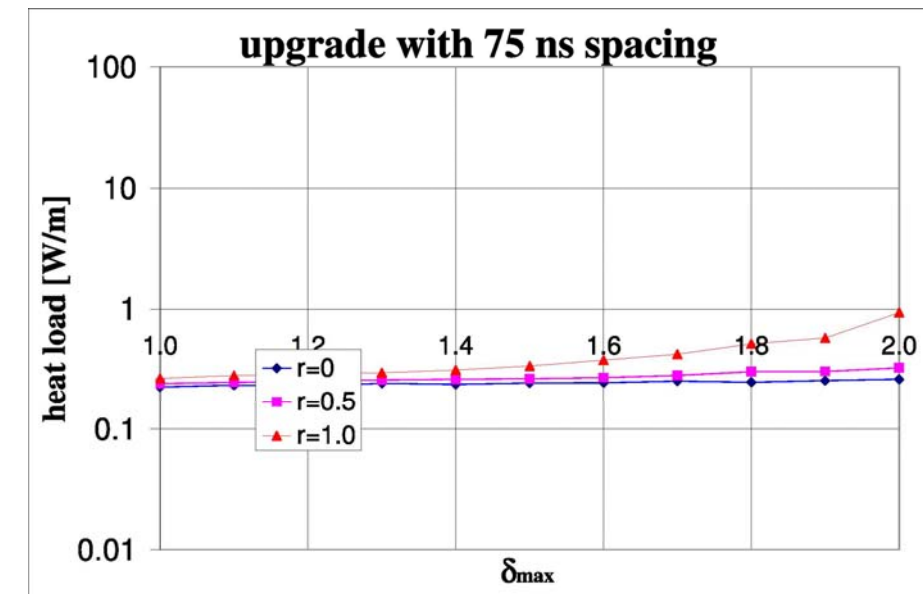
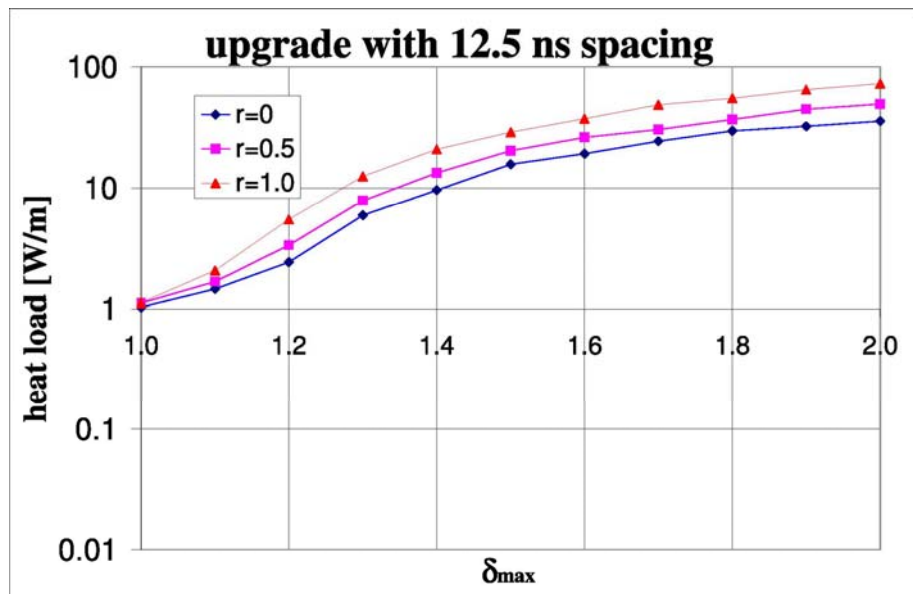
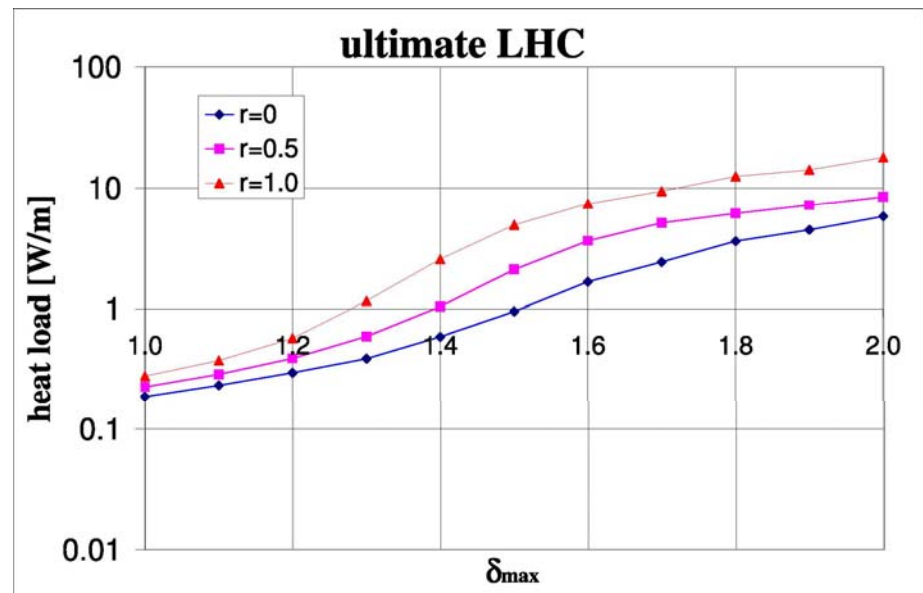
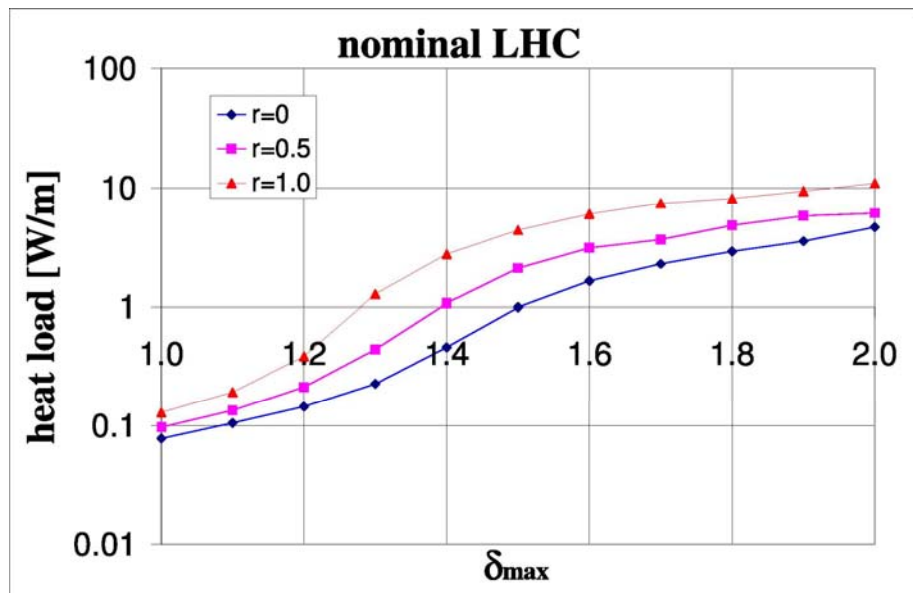
- ❖ nominal LHC
- ❖ ultimate LHC
- ❖ baseline upgrade
- ❖ 'Piwinski' upgrade

computing

- heat load
- central density of e- (single-bunch instability)
- electron flux on wall (vacuum)

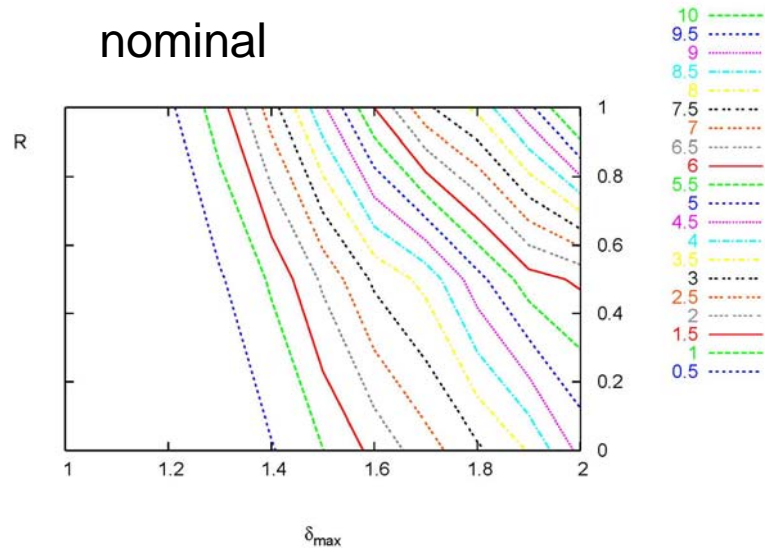
Scenario	Nominal LHC	Ultimate LHC	Standard upgrade	Piwinski upgrade
#bunches	2808	2808	5616	936
Bunch population	11.5×10^{10}	17.0×10^{10}	17.0×10^{10}	60×10^{10}
Bunch spacing	25 ns	25 ns	12.5 ns	75 ns
Bunch length	7.55 cm (σ)	7.55 cm (σ)	3.78 cm (σ)	50 cm (full)
Bunch profile	Gaussian	Gaussian	Gaussian	Uniform

heat load

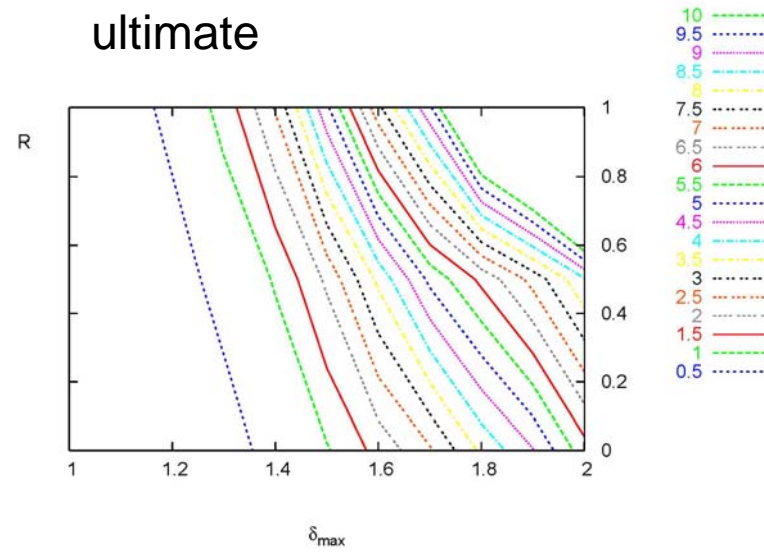


heat load contour lines R vs. δ_{\max}

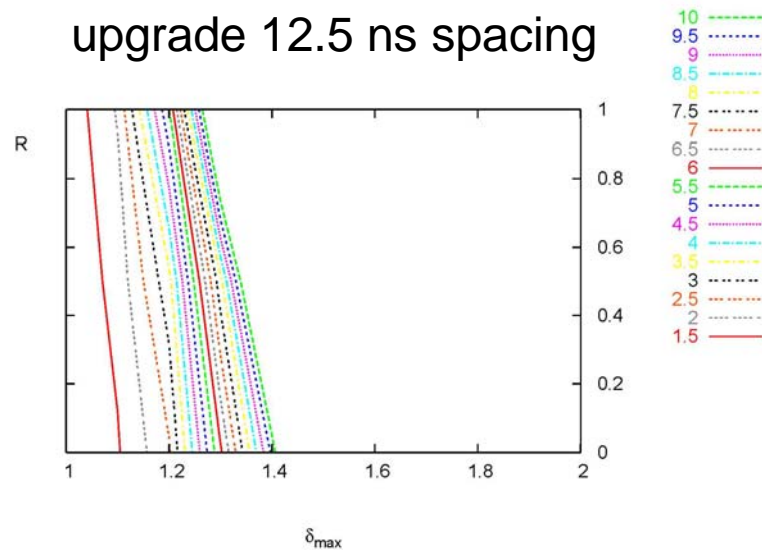
nominal



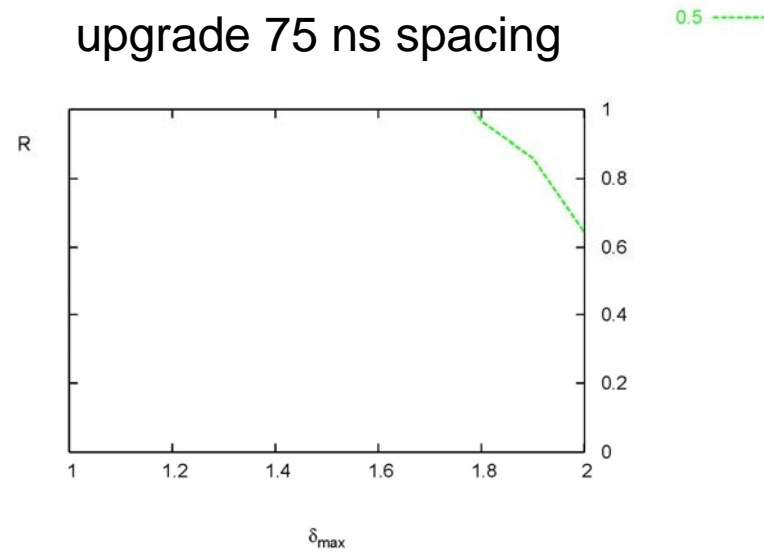
ultimate



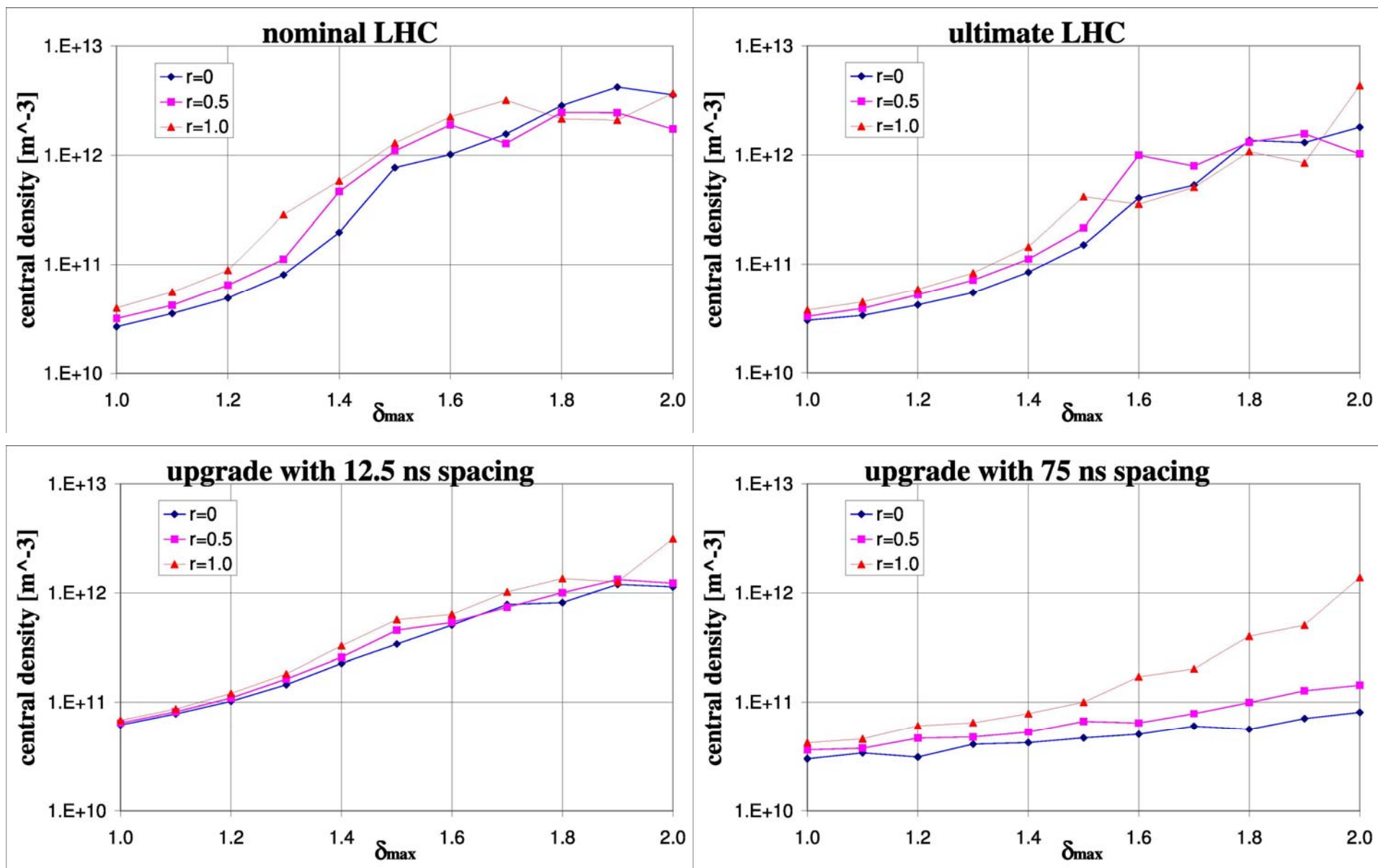
upgrade 12.5 ns spacing



upgrade 75 ns spacing



e- central density



e- flux on the wall (e- energies > 30 eV)

