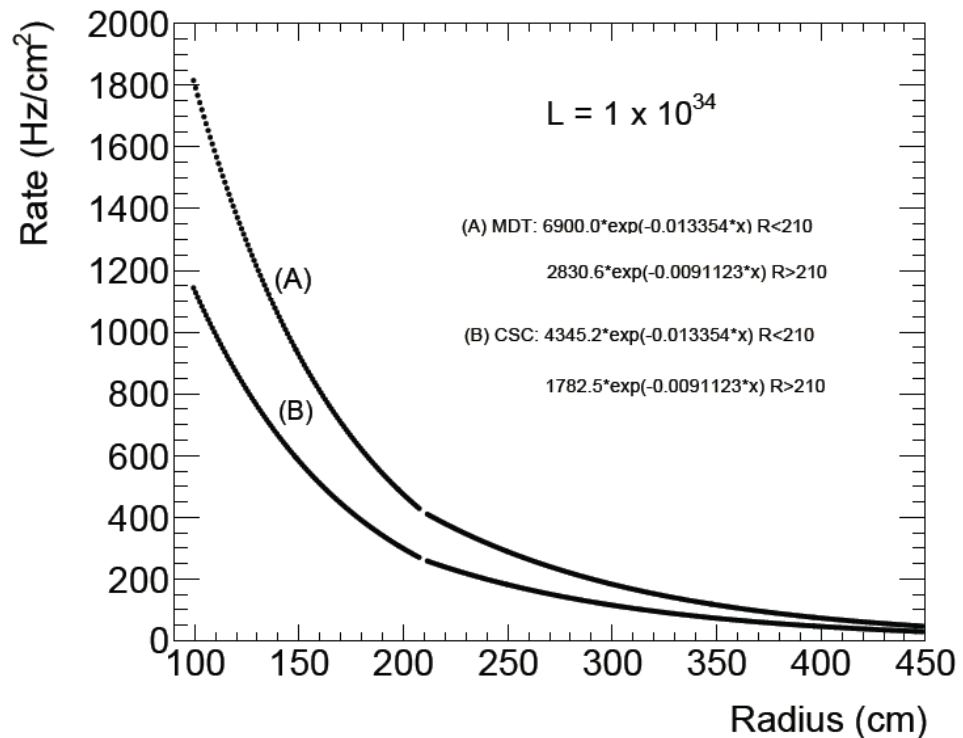# Rates in Parameter book

Daniel Lellouch
& Lorne Levinson

The bunch crossings issue

- Run I : 50 ns bunch spacing, 1400 bunches/orbit
- Run II, III, IV, …: 25ns spacing, 2800 bunches

→ Avoid misunderstandings in Luminosity extrapolation for both:
  - Hits/BX
  - Data rates

Current status of parameter book

- Based on TDR: computed for L= 7 10^{34} , assuming that CSC rates from Run I can be scaled ("various effects counterbalance")

L = 1 x 10^{34}

(A) MDT: 6900.0*exp(-0.013354*x) R<210

2830.6*exp(-0.0091123*x) R>210

(B) CSC: 4345.2*exp(-0.013354*x) R<210

1782.5*exp(-0.0091123*x) R>210

Both Ilia's note on 2012 rates and Michael Schernau's presentation, which are based on number of triggers and gate length, refer to Hz/cm²
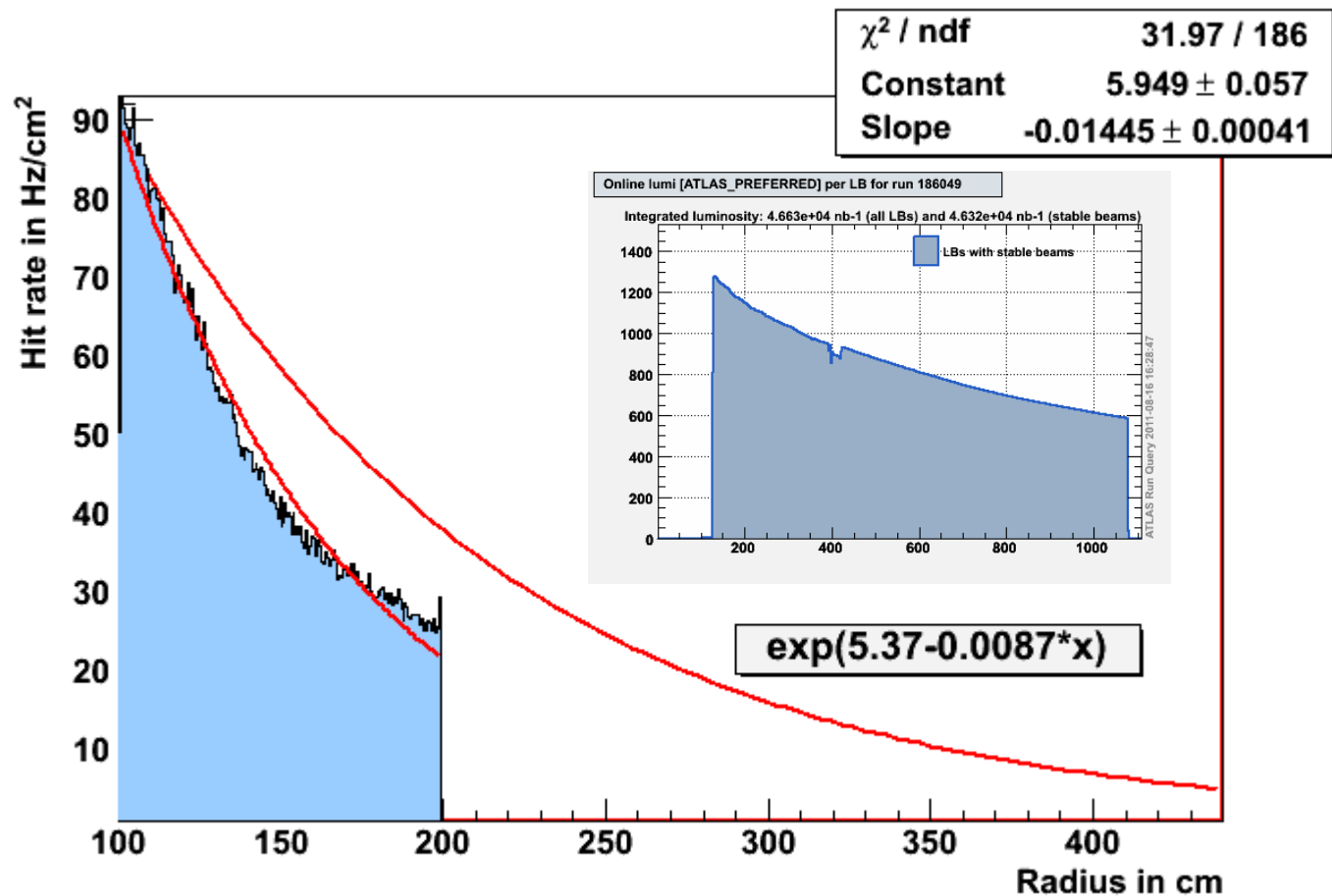
My conclusion : no factor 2 to help us in luminosity extrapolation

- Rates in kHz/cm^2 are **OK** in parameter book.

- However: number of hits/BC becomes higher!
  - Instead of 40MHz , on should divide by 40*2808/3556 = 31.6 MHz
  - This corresponds to an increase of 25% for single hit probability, and in proportion for combinatorics

- Data flow, bandwidth, etc... are OK in most places and almost OK whenever there is header suppression.