

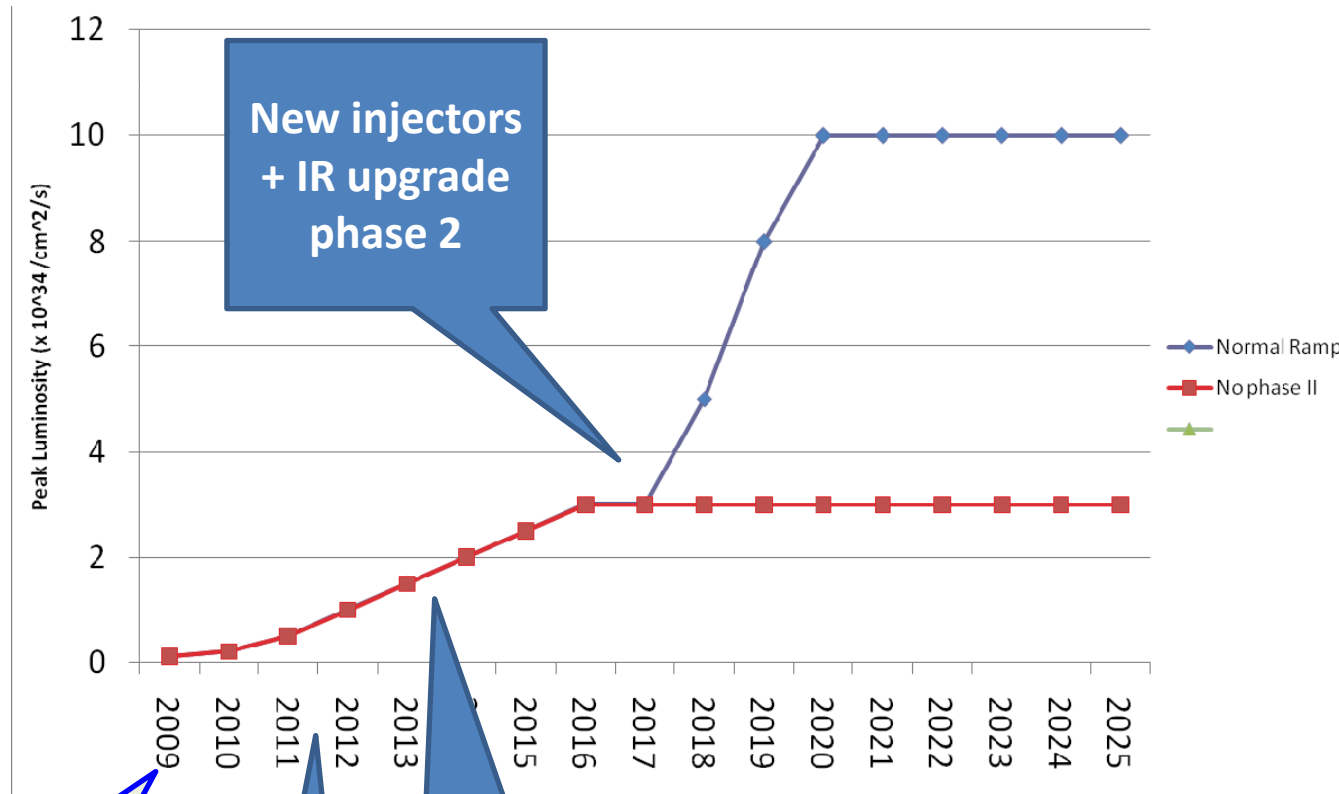
# **1<sup>st</sup> LHCC Upgrade Session**

## **Wrap Up on Timescales**

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# Peak luminosity...



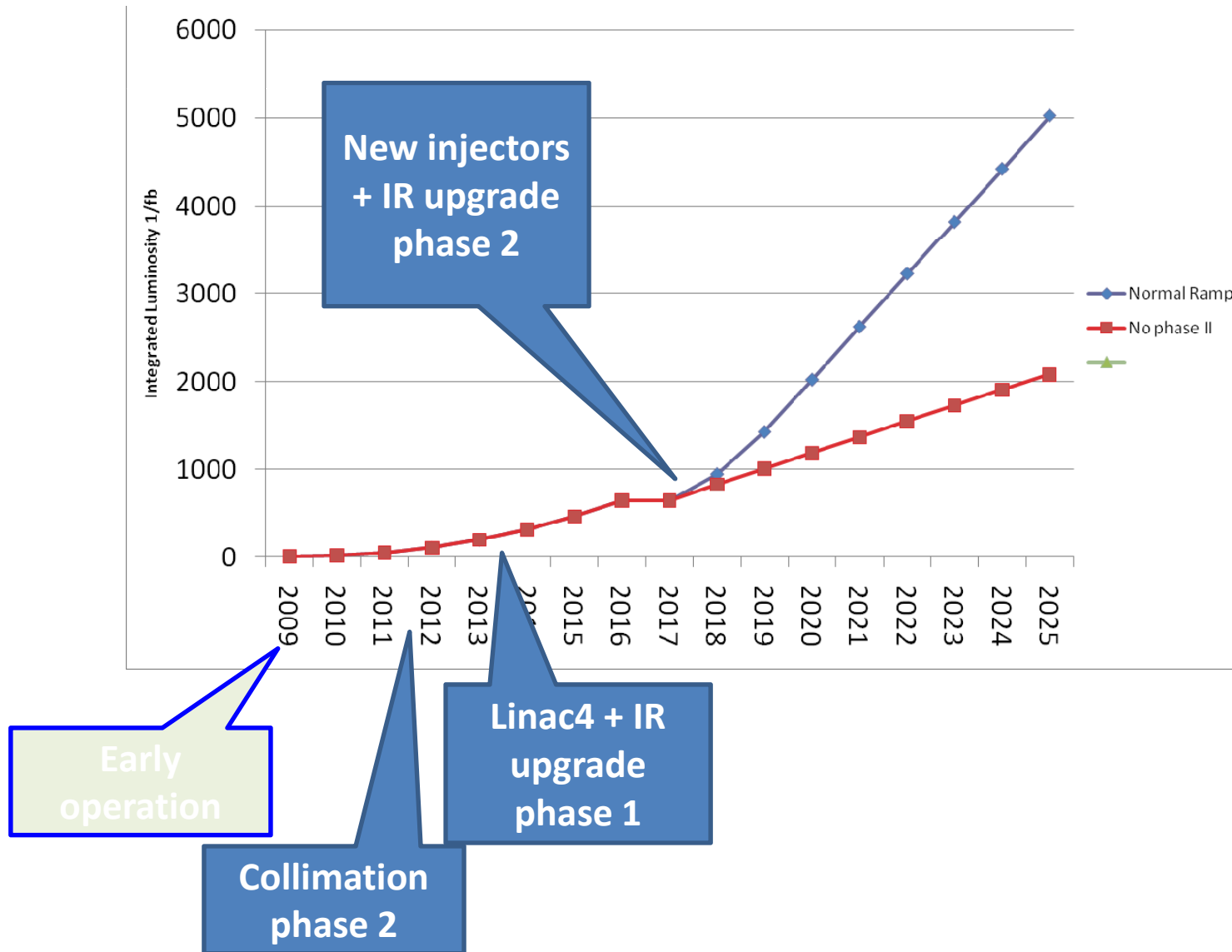
New injectors  
+ IR upgrade  
phase 2

Early  
operation

Collimation  
phase 2

Linac4 + IR  
upgrade  
phase 1

# Integrated luminosity...



# Lumi evolution plots

- Should we get some kind of semi-formal agreement that this is what all players show
  - with a commitment to update this as thinking evolves
- Can we agree on CY2017 as target for long shutdown?

# Phase I timescales

- Are very tight
- LHCC should evaluate phase I plans quite urgently
  - a natural focus for next evaluation meeting?

# Phase II Timescales

- Very difficult to reconcile needed timescales for machine and experiments
- Compare:
  - Desire of experiments to submit TDRs by mid-2010 to get approval in time
  - Difficulty of getting LHC machine upgrade decisions by mid-2011 given R&D needed and speed with which currently being done
    - an opportunity for outside contributions here!!!
- Preference of experiments is clear:
  - Full Crab Cavity plus lumi leveling
  - Multiple interactions at 25 ns better than 50 ns (large Piwinski angle)
  - Avoids needs for dipoles inside detectors (Early Separation)
  - Lumilevelling clearly helps avoid excessive peak lumi at start of fill
- But since no one scheme is guaranteed to be brick wall free!
  - machine needs to continue to pursue various options
    - including those that are rather unpalatable for the experiments
- Experience of real running also an essential input to design
  - both for machine and experiments
- LHCC should ask for experiment LoI, TP, TDR, etc, on an agreed timescale
  - LoI mid-2009?
  - TP mid-2010?
  - TDR mid-2011?