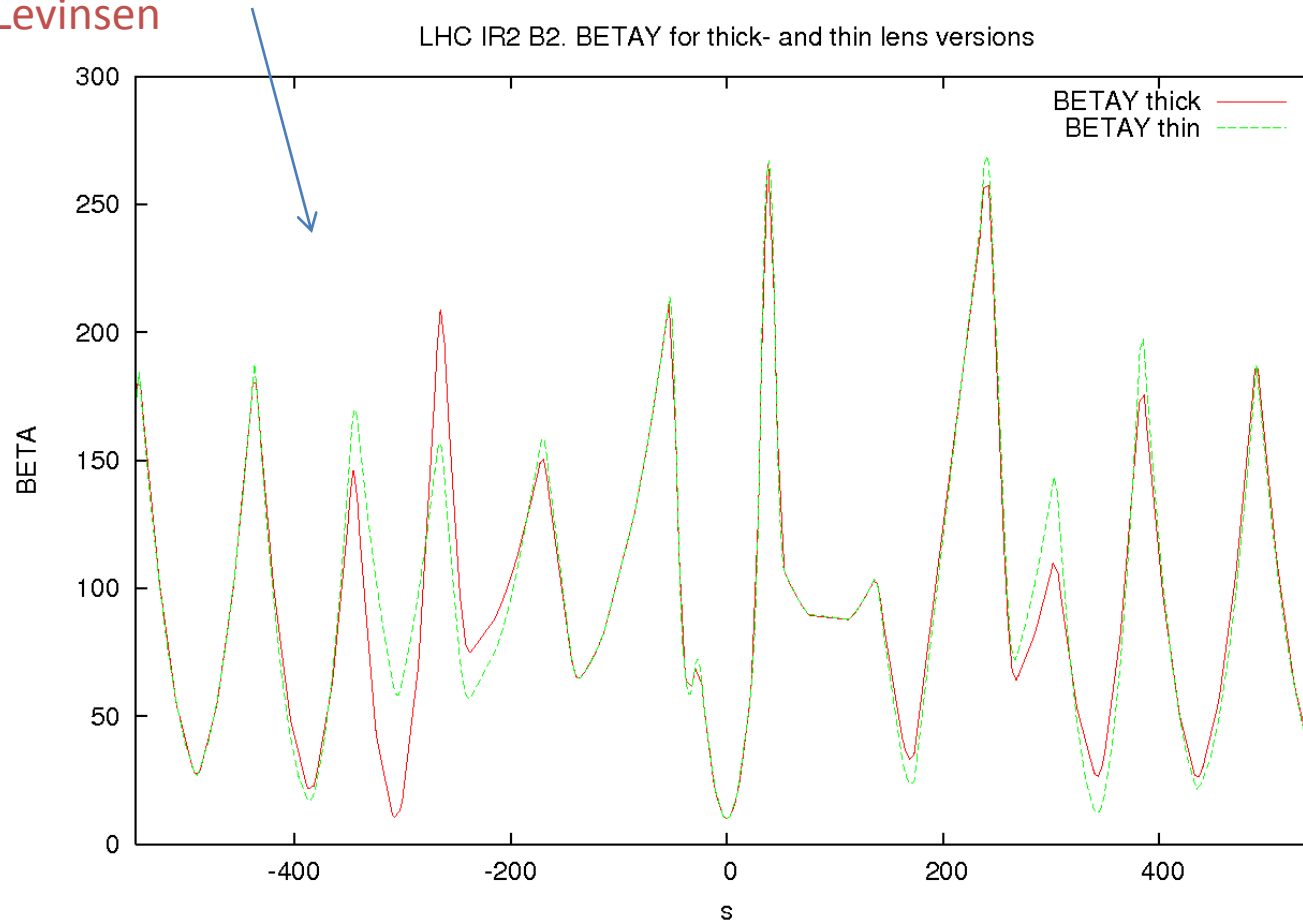


# MATCHING. THICK vs THIN LENS

Bad matching in IP2 discovered by  
Yngve Levinsen



# WHY USE A THIN LENS MODEL:

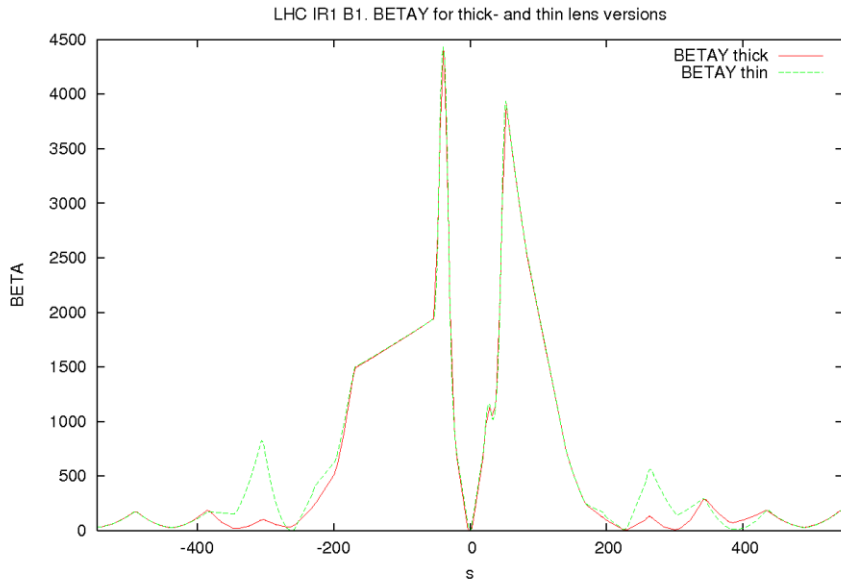
- TRACKING

A thin-lens model of a magnet is much faster to calculate than a model of a thick magnet.

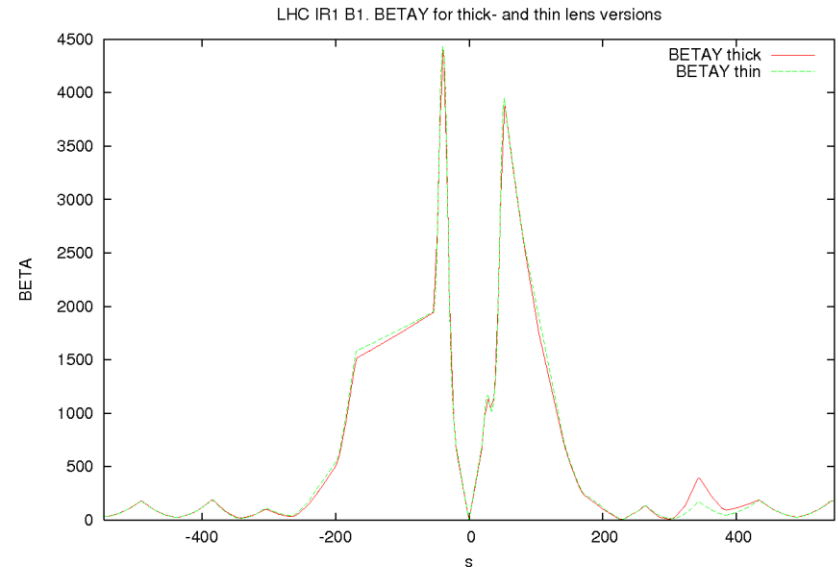
One of the uses of tracking is to make a loss map  
i.e. At which positions in the accelerator, are we losing particles?

# WHY IS THE MATCHING WORSE NOW, THAN IS WAS IN THE PAST?

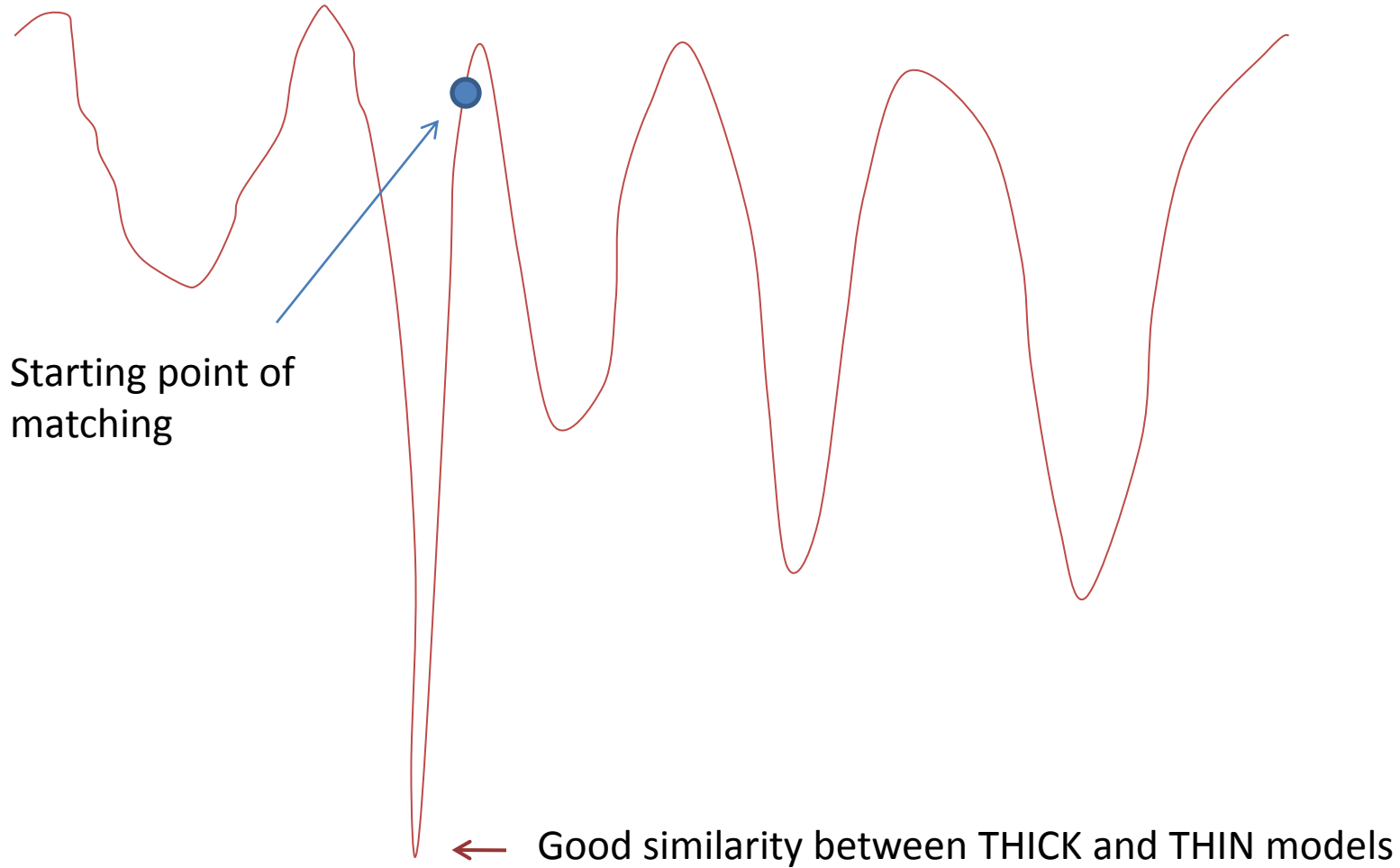
## V6.503



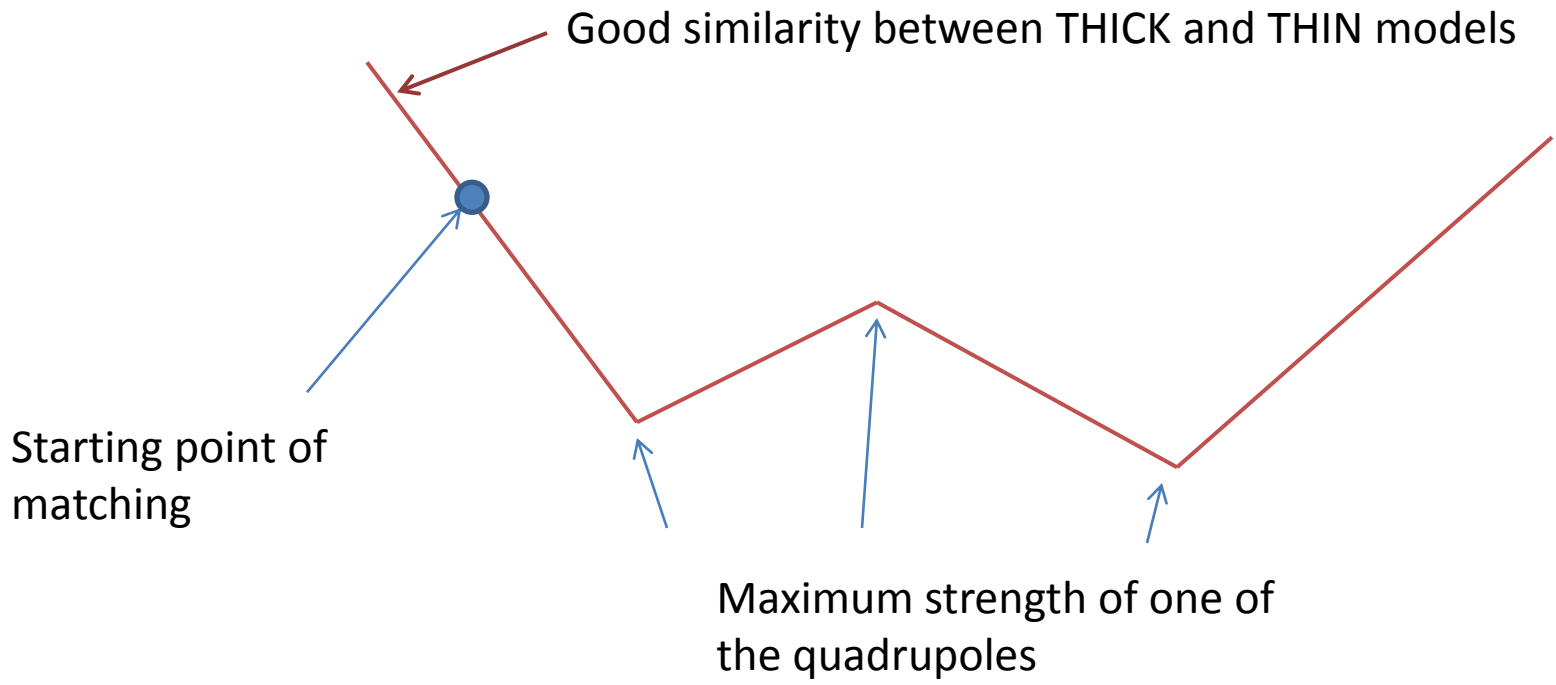
## V6.500



# WHY IS THE MATCHING WORSE NOW, THAN IS WAS IN THE PAST?



# WHY IS THE MATCHING WORSE NOW, THAN IS WAS IN THE PAST?



# WHY IS THE MATCHING WORSE NOW, THAN IS WAS IN THE PAST?

Matching rule:

- Always start with the strengths of the thick magnets
- Avoid reaching maximum (or minimum) strength of a quadrupole. This is done by blocking Q13 and Q12 (the quadrupoles furthest away from the IP)
- Add first Q12 and at last Q13

