

MD-request for high- β^* in 2012

2011 high β^* program started very well with intermediate $\beta^* = 90$ m

2012 : TOTEM + ALFA would like to get to the Coulomb region

potential to measure σ_{tot} and L to 1%

always known to be very difficult in the LHC

--- motivated development of VdM

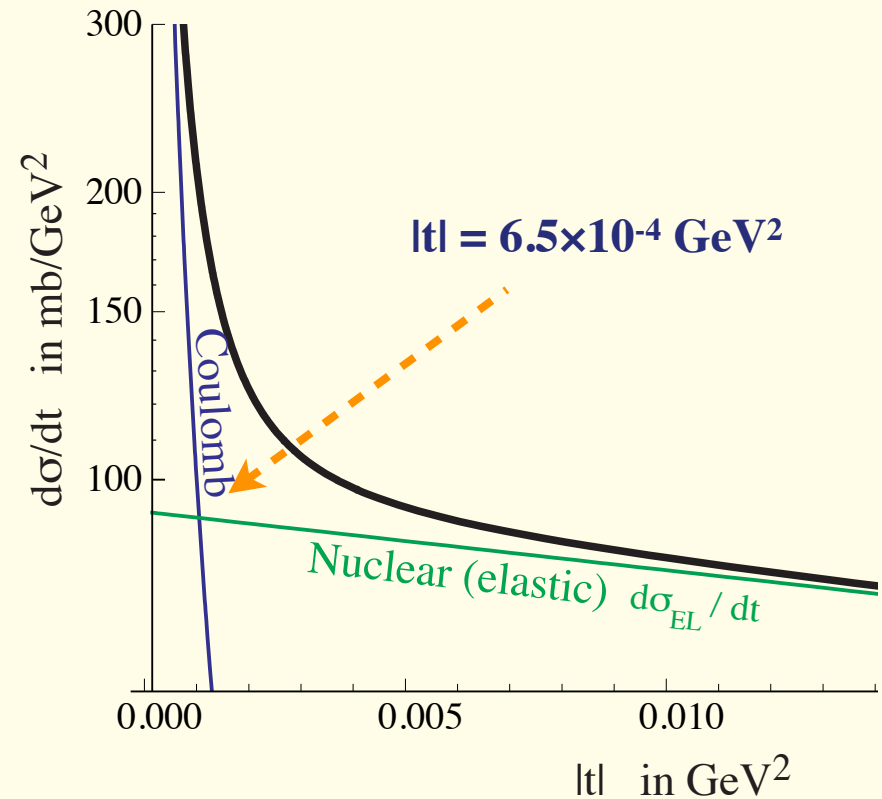
TOTEM request $\beta^* > 850$ m

ALFA request for β^* of 500 -- 1000 m

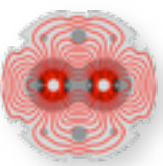
Told them $\beta^* > 500$ m is not very realistic in 2012

for < 8 days of special running and

requires a very aggressive MD study program



In addition : studies relevant for adding missing cables / Q4 polarity in LS1



MD de-squeeze to ~ 500 m β^*

MD scraping to reduce emittance to $1\mu\text{m}$ at top energy

could allow to get to the Coulomb interference region at $\beta^* \sim 500$ m with RPs very close to beam

MD injection with 90 m optics in IP1&5 -- to speed up operation with high- β^*

MD* on max. β^* without extra cables, attempt to go towards $\beta^* \sim 1000$ m

MD* squeeze with colliding beams cannot separate at $\beta^* \sim 1000$ m

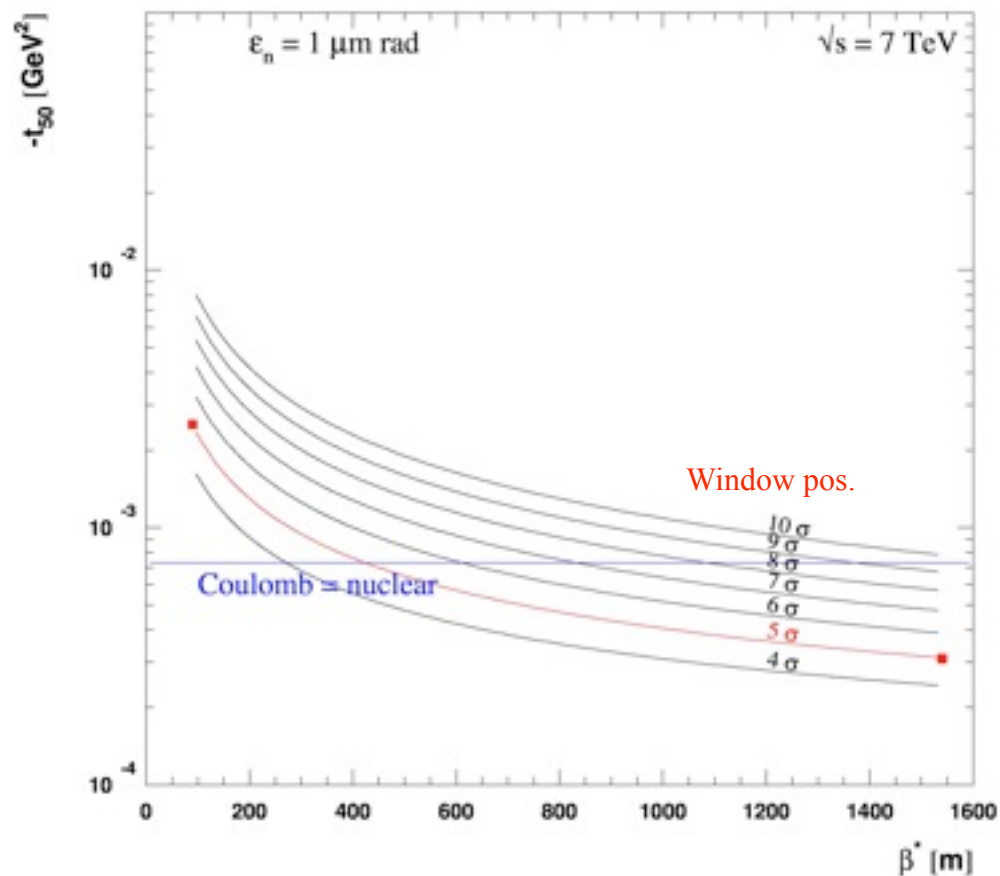
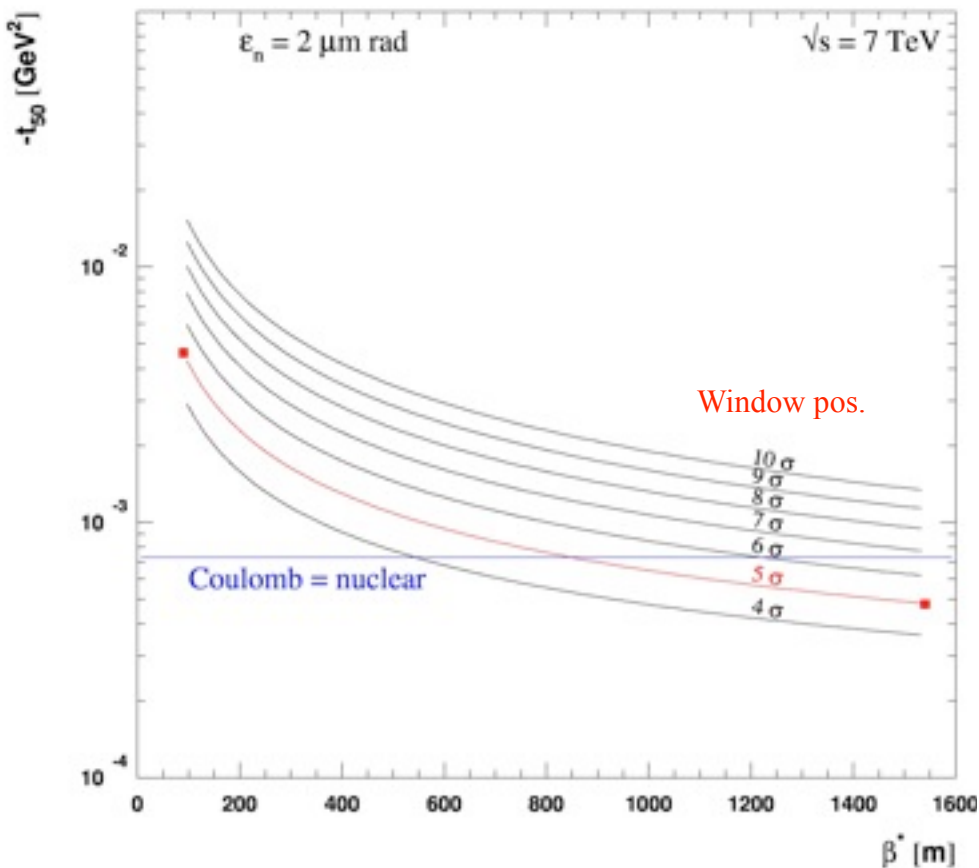
MD* Q4 inversion, injection at 200 m β^* required if we ever have to go beyond $\beta^* 1.5$ km

MD* on longitudinal separation using RF for very high β^* , like injection at 200 m and operation > 1 km

***MDs relevant for LS1 work, strategy for β^* above a 1km at full energy**

Backup

How to reach the Coulomb Region ?



- Low emittance is a key requirement
- To reach the Coulomb region, $\epsilon_n < 2 \mu\text{m rad}$ and $\beta^* > 850 \text{ m}$ is needed (assuming RPs at 5σ)
- RP positions have to be calculated based on actual not nominal emittance, otherwise no gain in t !
- Parallel-to-point focussing in y is required, but it can be dropped in x.