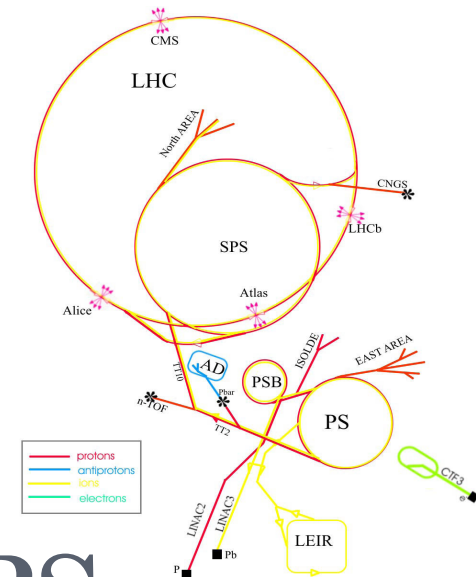


THE UA9 EXPERIMENT IN SPS

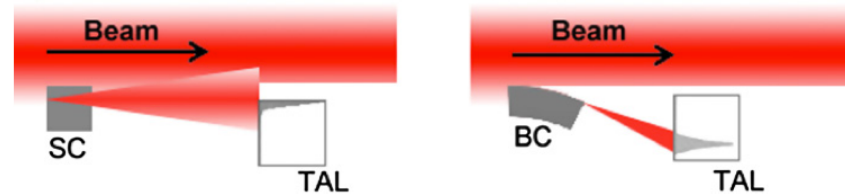
Beam halo collimation with bent crystals

Emelie Nilsson, Chalmers University of Technology
Supervisor: Walter Scandale



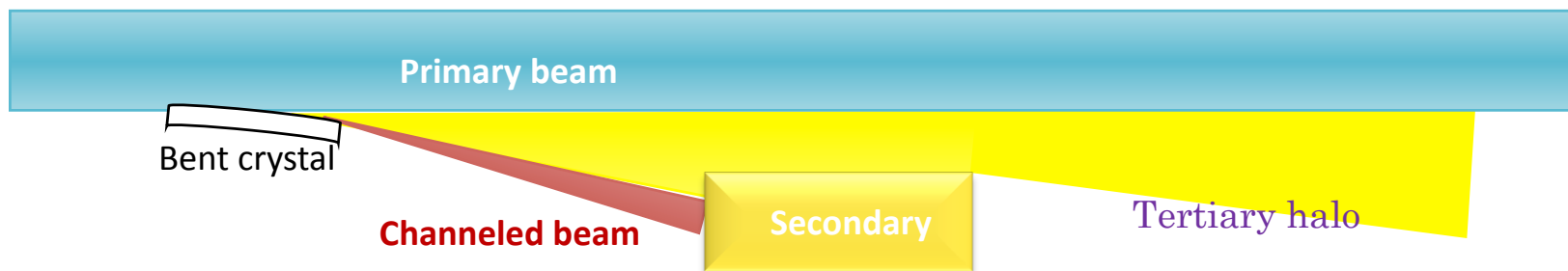
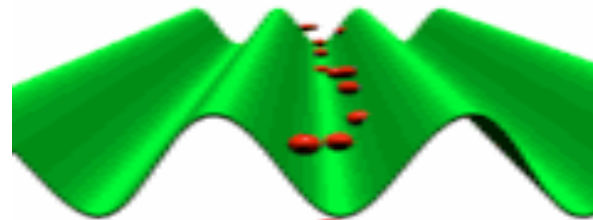
BEAM HALO COLLIMATION

- Clean up momentum spread in beam
- Extract protons from beam halo

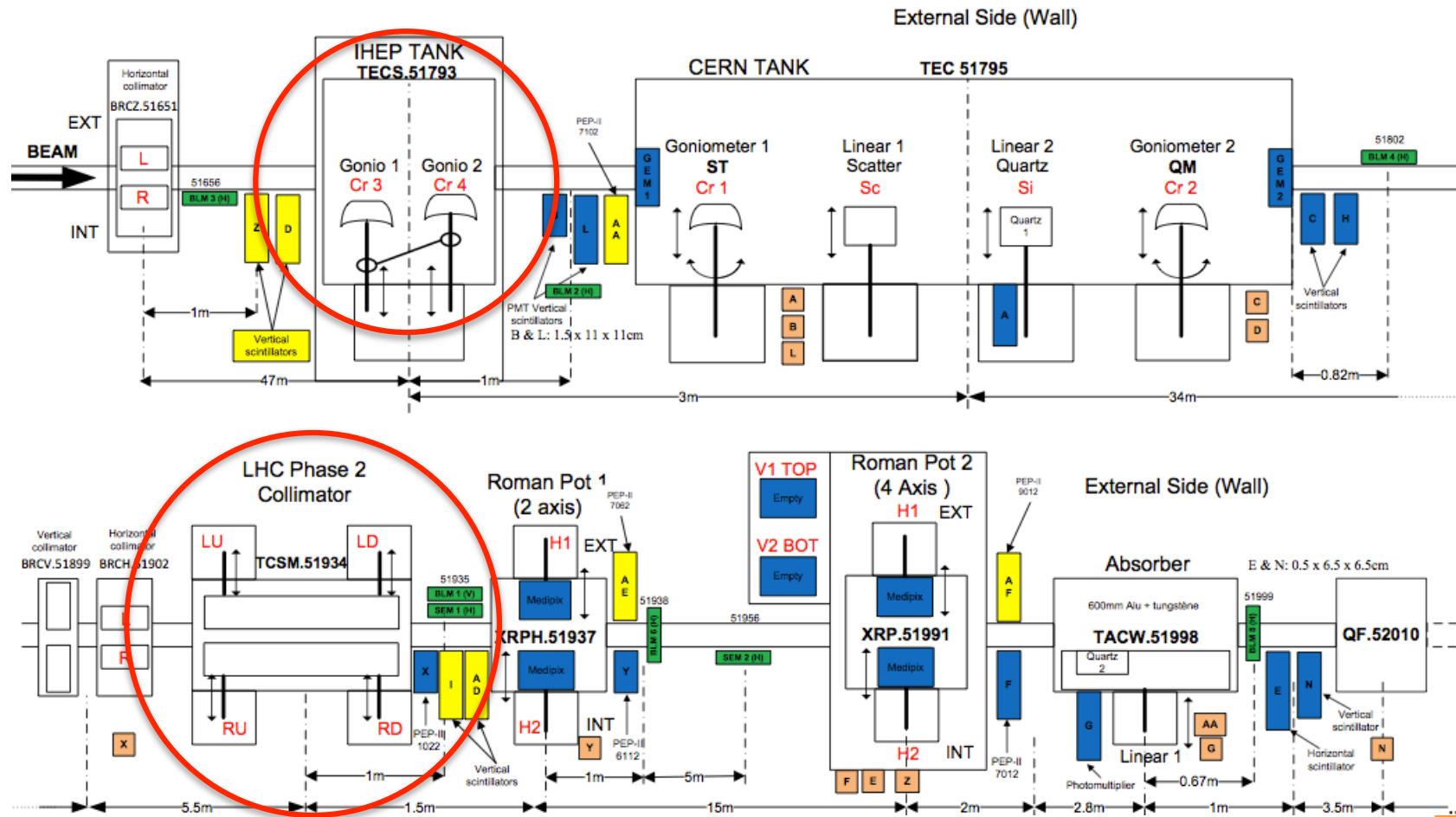


CRYSTAL COLLIMATION

- Channeling: constrains the path of the protons



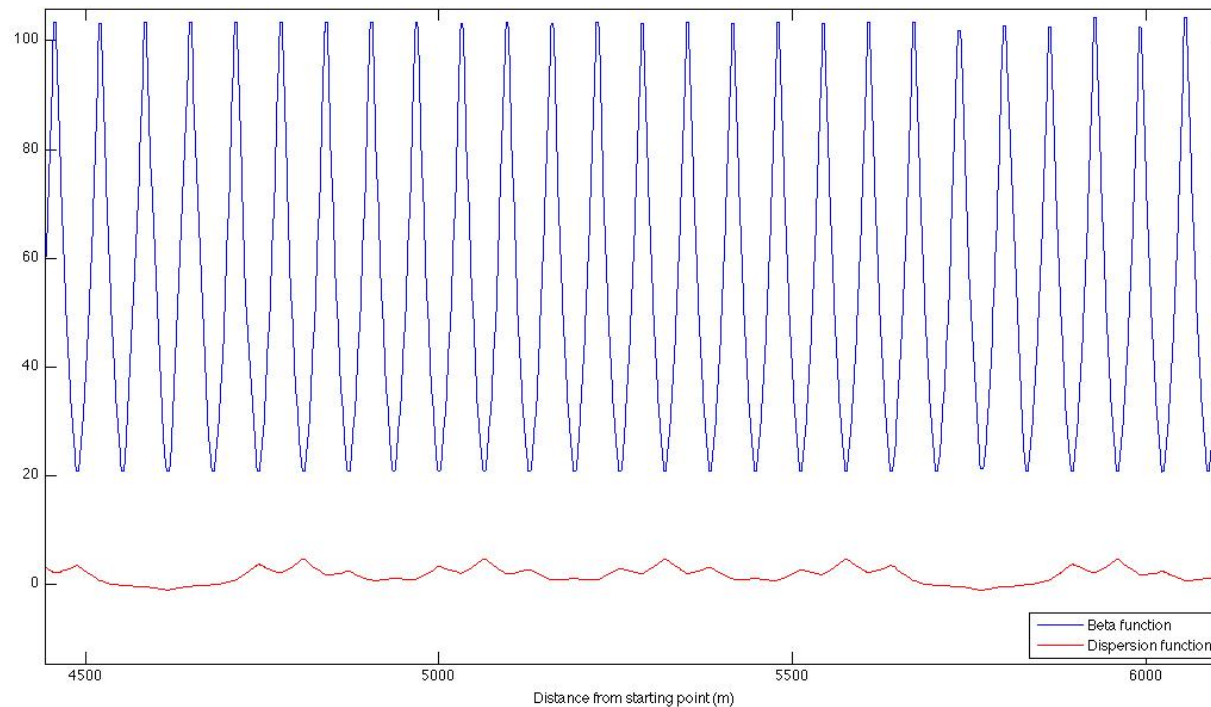
EXPERIMENTAL SETUP OF UA9



SIMULATION OF PARTICLE INTERACTION IN CRYSTAL

Define optics of SPS in MAD-X

Quadrupoles, collimators, aperture, beam...

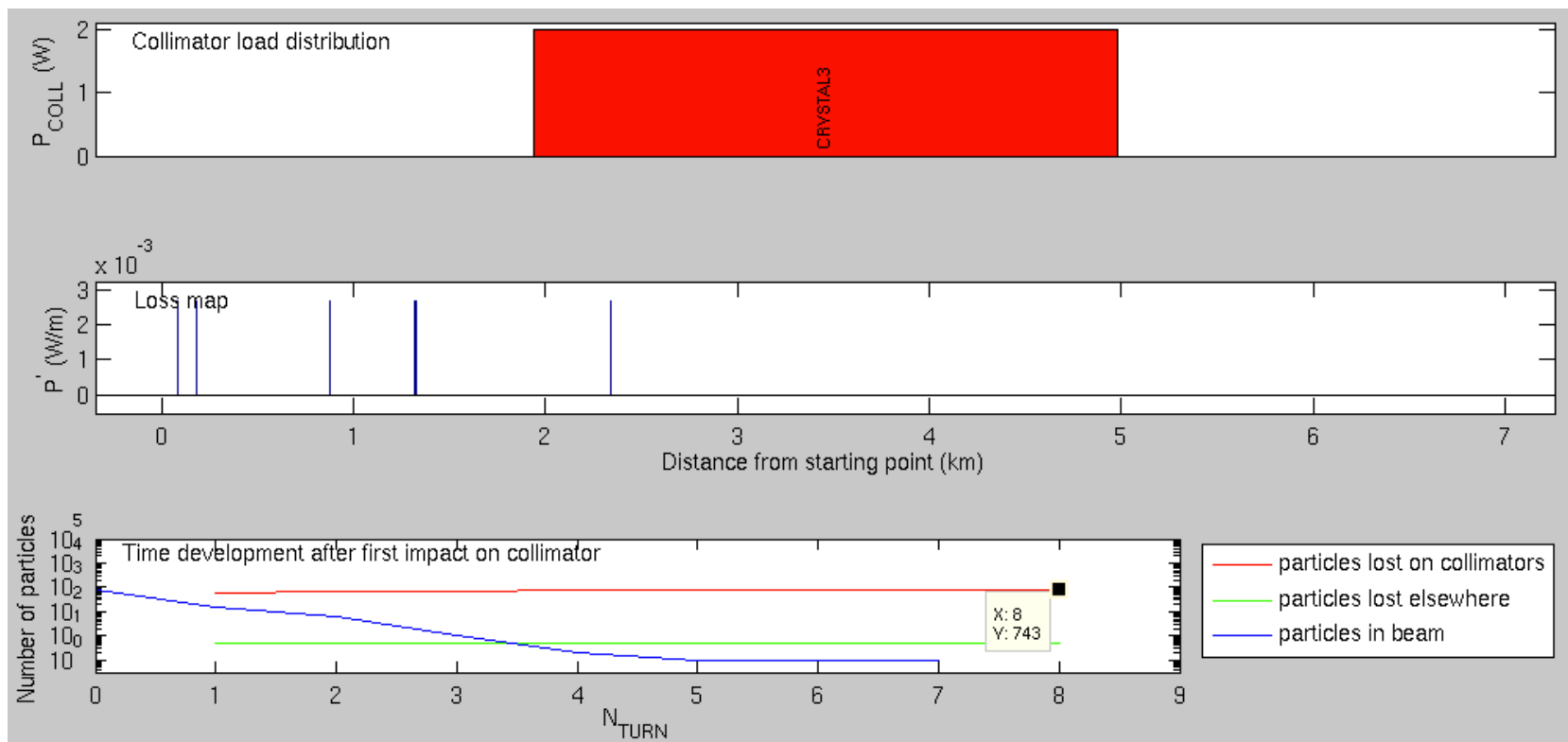


OUTPUT:

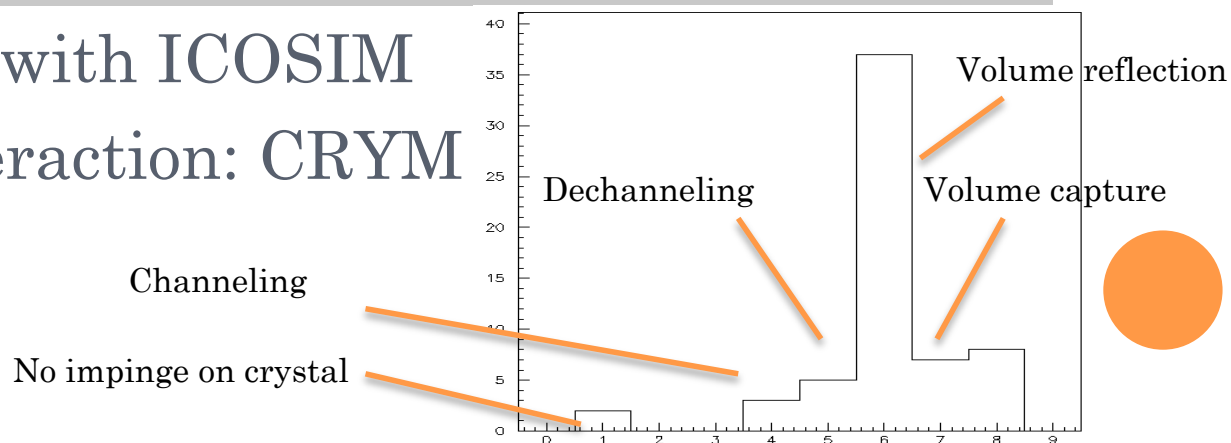
-Betatron function -Dispersion function -Tune



TRACKING EACH PROTON



- Particles tracked with ICOSIM
- Beam-crystal interaction: CRYM



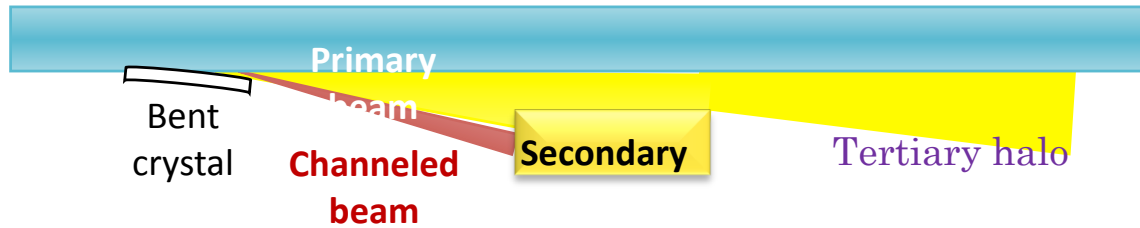
SPS MEASUREMENTS

EXPLORE CRYSTAL COLLIMATION

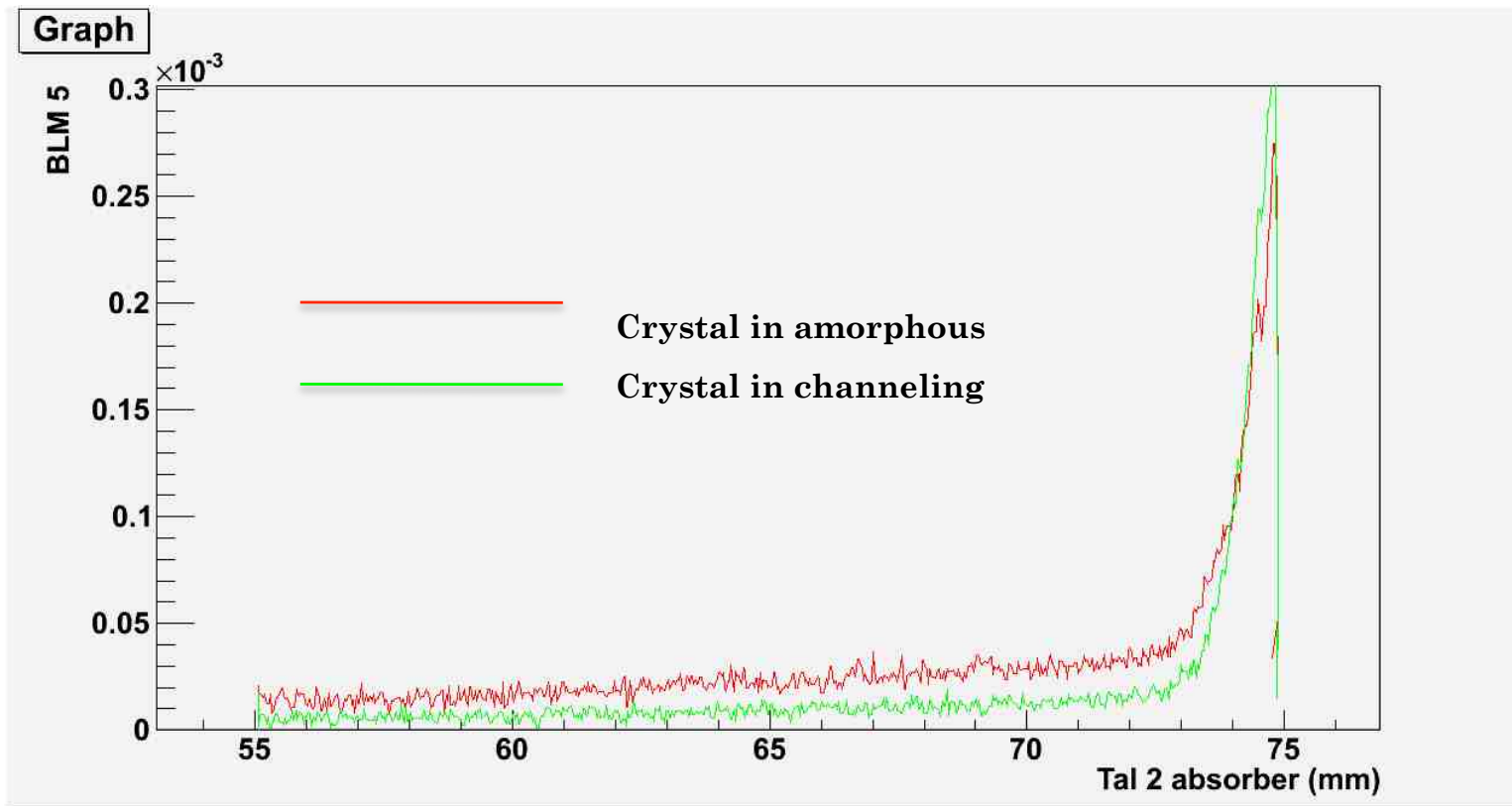
- Angular scan: Losses crystal in amorphous vs channeling
- LHC collimator scan: Crystal channeling efficiency
- Dispersive area scan: Study tertiary halo reduction



DISPERSIVE AREA SCAN:



- Study of tertiary halo reduction
- Scan of absorber, crystal in amorphous vs channeling

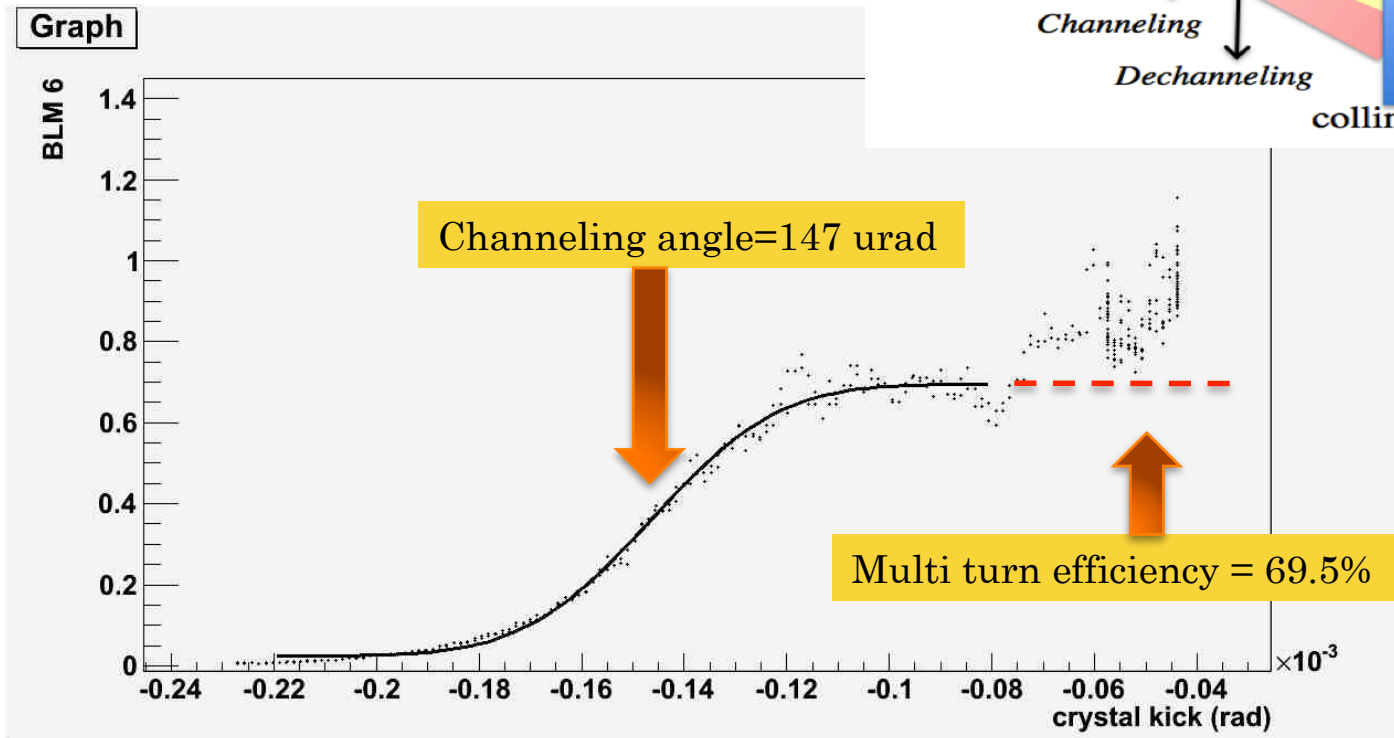
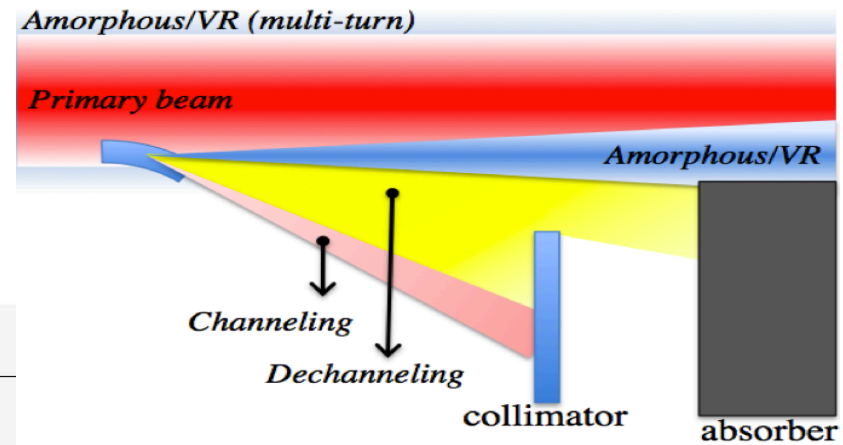


Reduction factor: **2.7 times more losses** for amorphous



LHC COLLIMATOR SCAN:

- Gradual insertion of collimator while crystal in channeling position
- Shower from LHC collimator
- Analyze halo generated by crystal





MEMORABLE MOMENTS

- Workshop activities
- 24 h data taking

MORE TO LOOK FORWARD TO...

- Access SPS during technical stop
- New data taking coming up

IS IT CRYSTAL CLEAR?



QUESTIONS?

