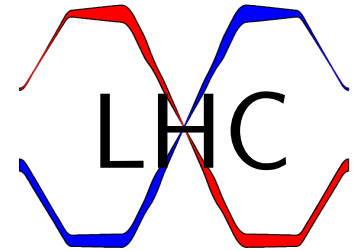


MACHINE PROTECTION

R. CALAGA, J. BARRANCO, R. TOMAS

LHC-CC10, DEC 15-17, 2010

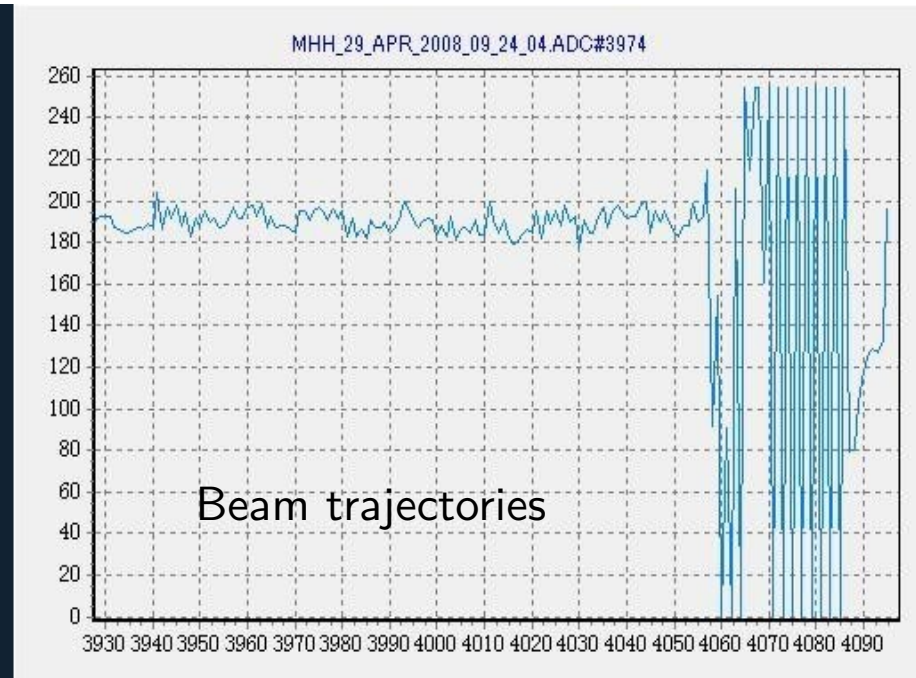
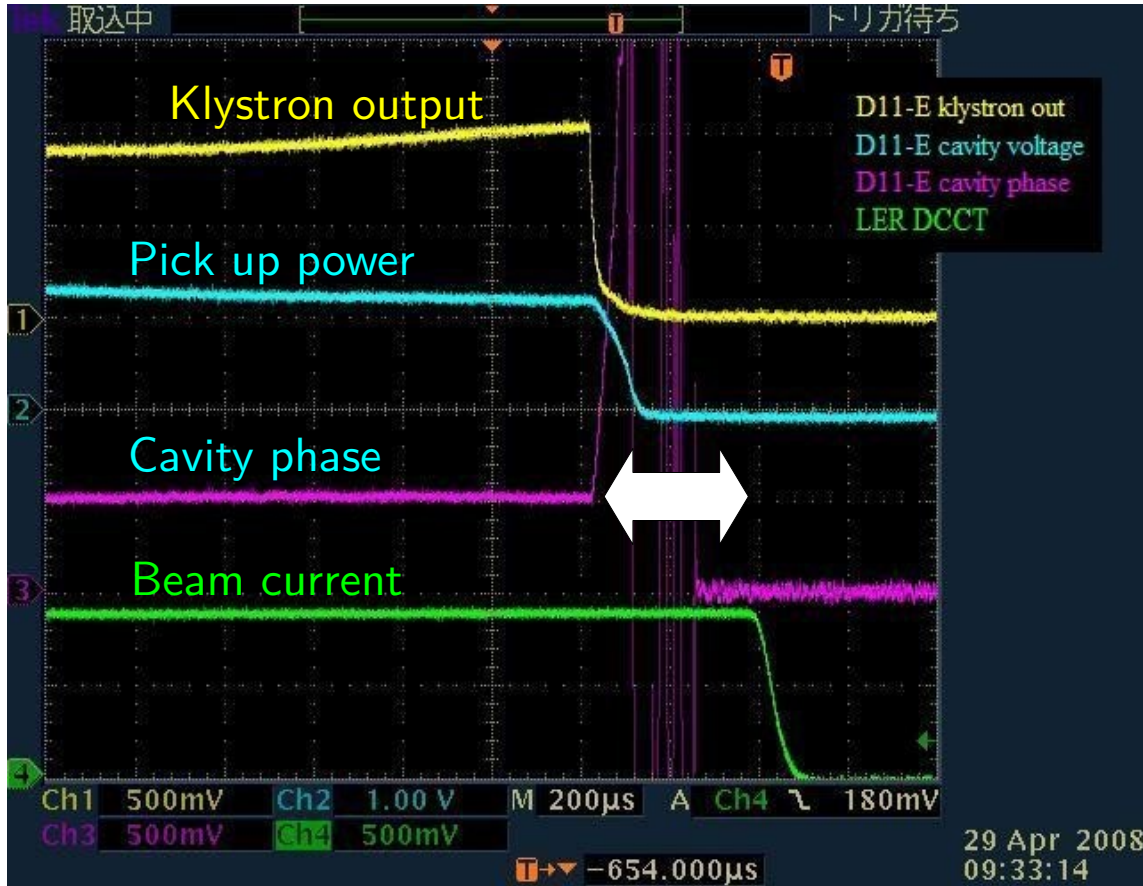


- Sixtrack Setup using Collimation Tools
- First Results

Many Thanks:

C. Bracco, R. Bruce, Y. Sun, B. Yee, F. Zimmermann

RF TRIP EXAMPLE (KEKB)

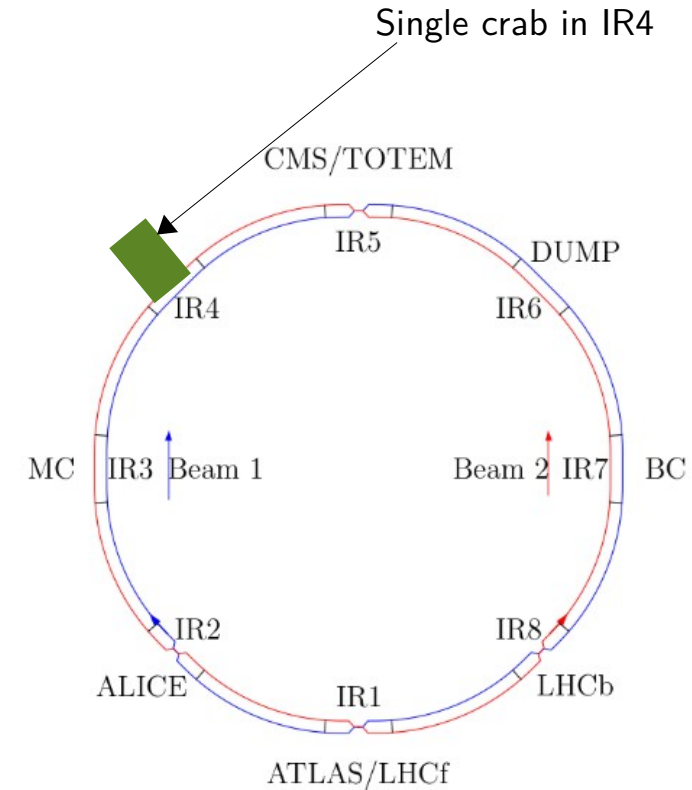
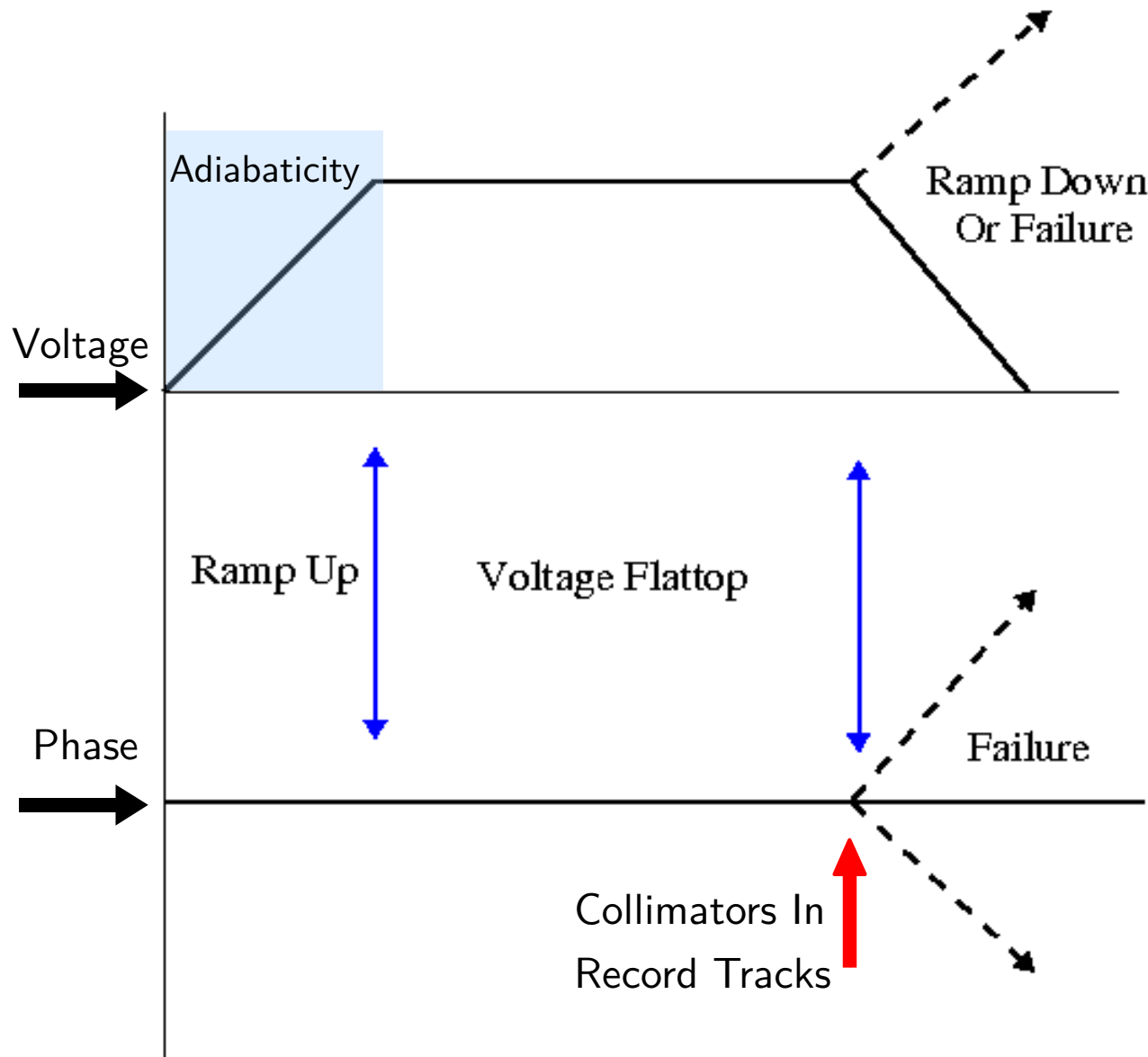


Intentional/non-intentional phase changes → corresponding orbit changes and beam losses

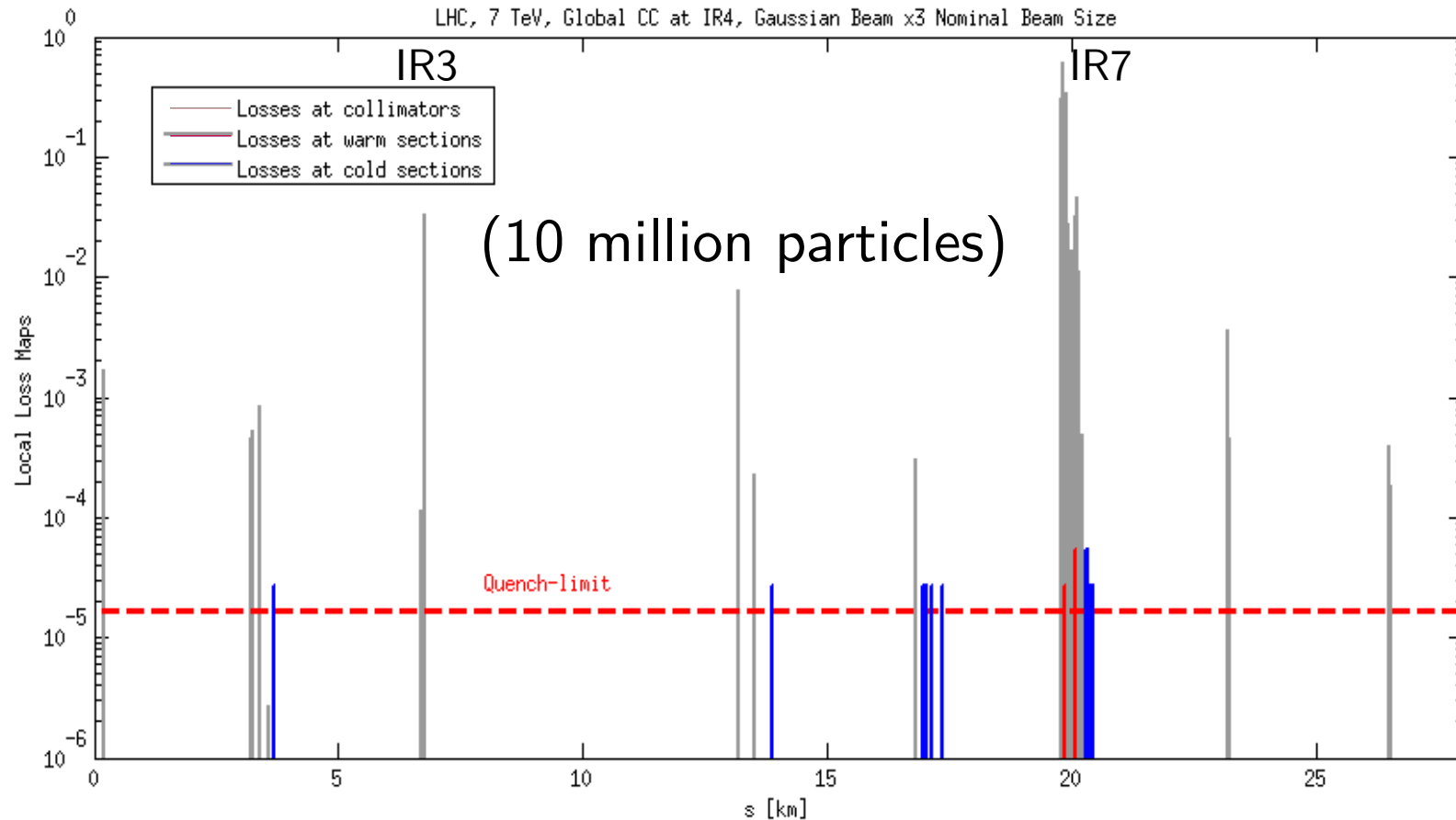
Approx time scale → 50 deg in 50 μs (1/2 LHC turn)

SIMULATION SETUP

Voltage is kept constant during phase failure and vice-versa

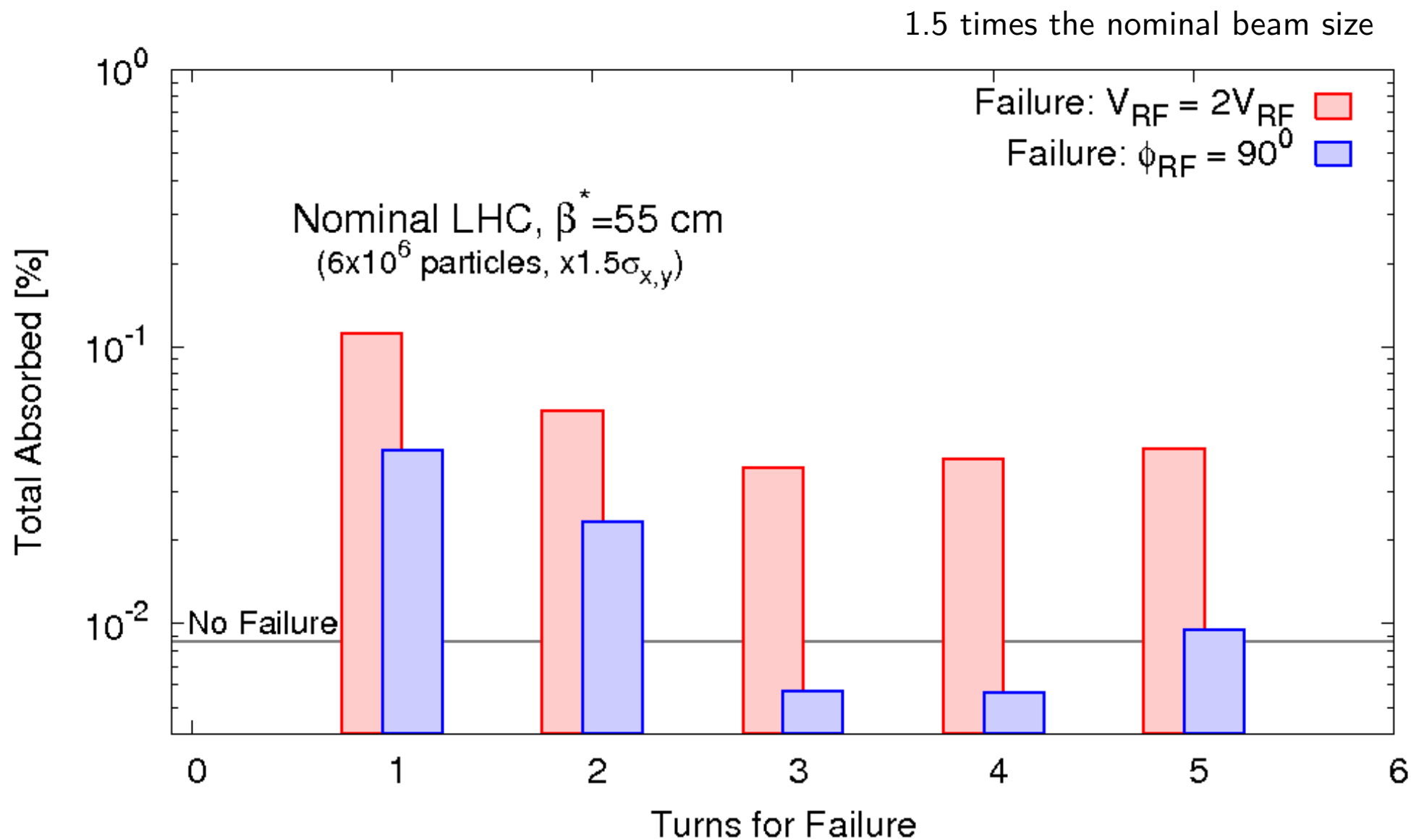


EXAMPLE LOSS MAP (PESSIMISTIC CASE)



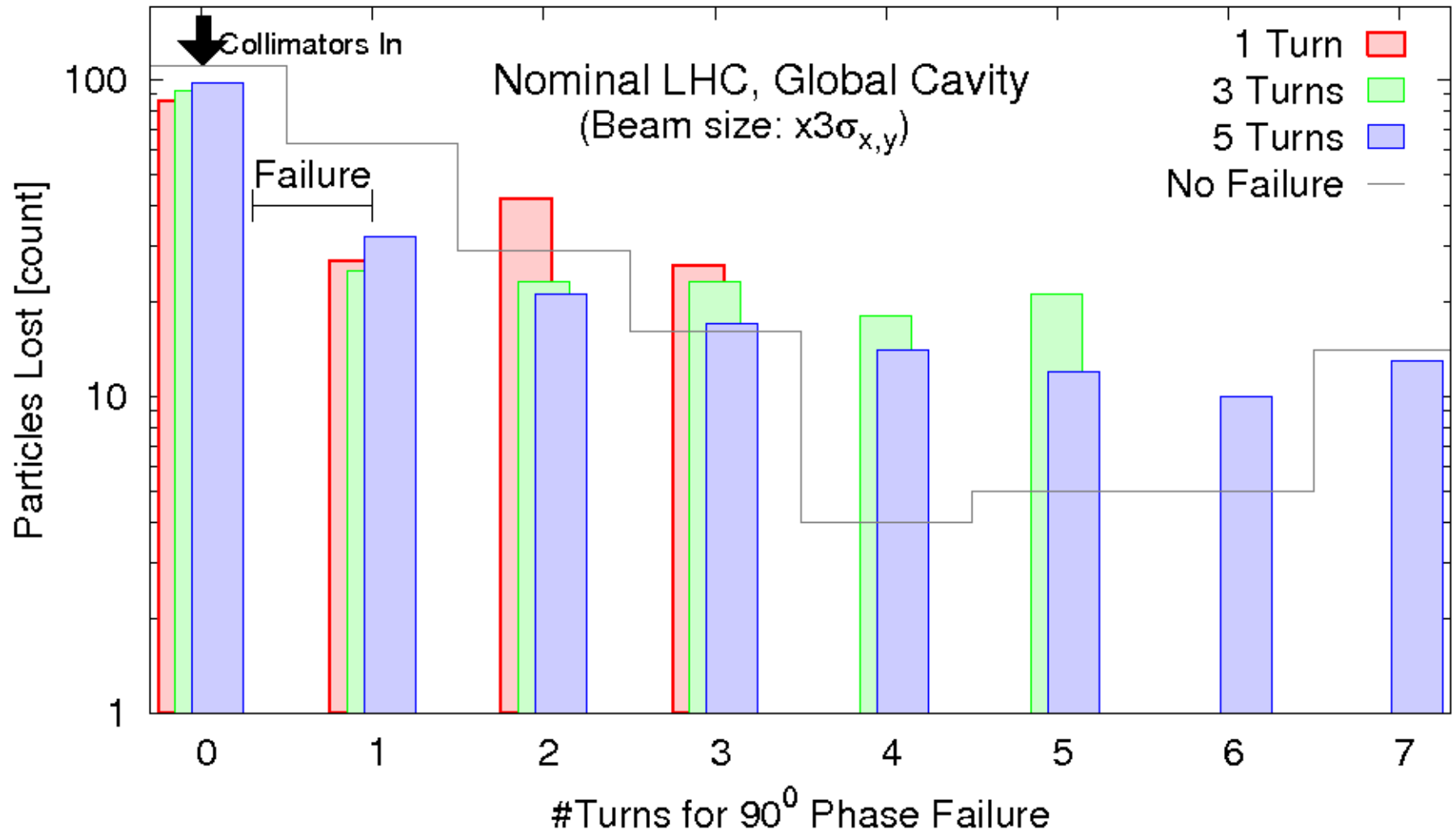
- Beam size is 3-times nominal beam (overpopulated tails)
- A failure of 3-turns induced where **phase shift 90** degree occurs
- 4% of total particles absorbed in the collimators

% ABSORBED DUE TO FAILURE



Main losses are in the collimators in IR7, IR3 and the TCTs

OF LOST DUE TO $90^\circ \phi$ -FAILURE



Artificially large beam \rightarrow to study the losses as a function of turn

No particles lost for $\times 1.5$ the beam size (voltage or phase failure)