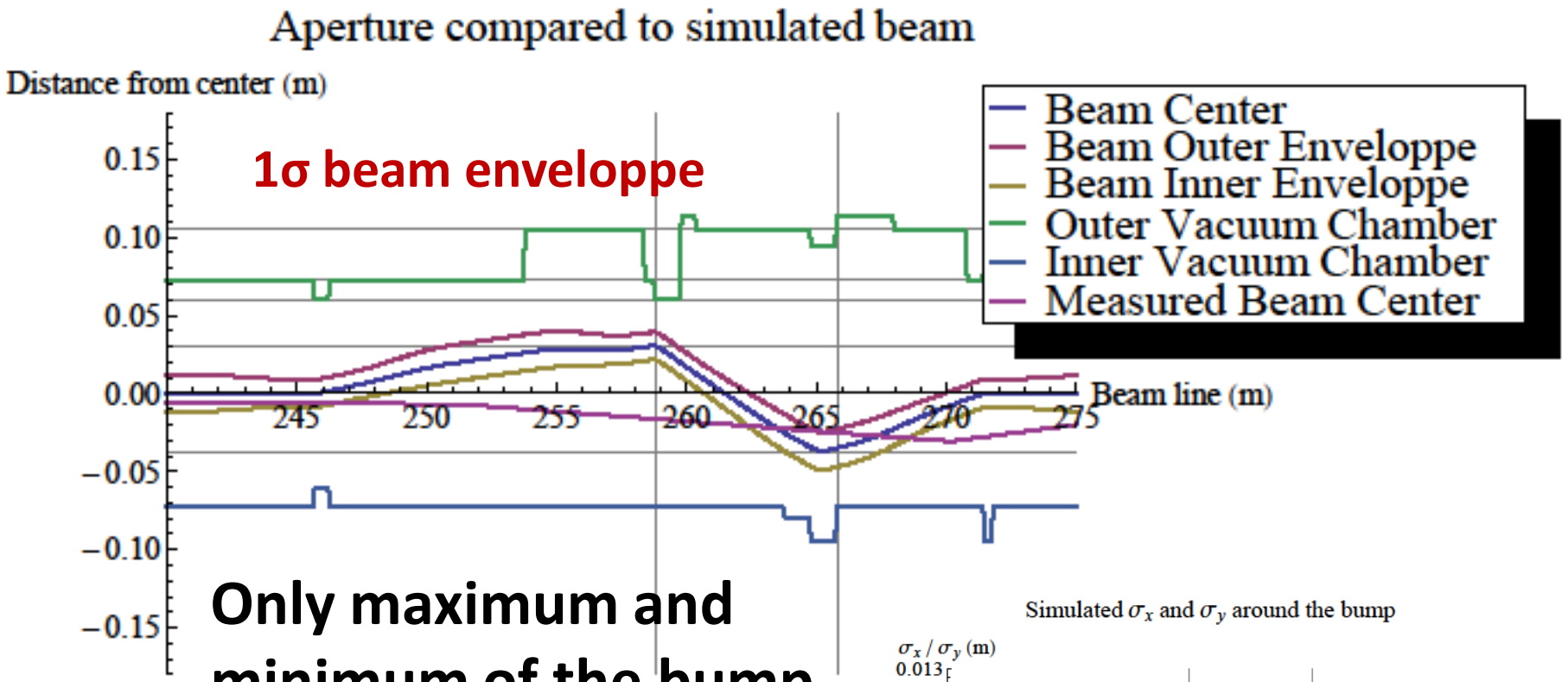
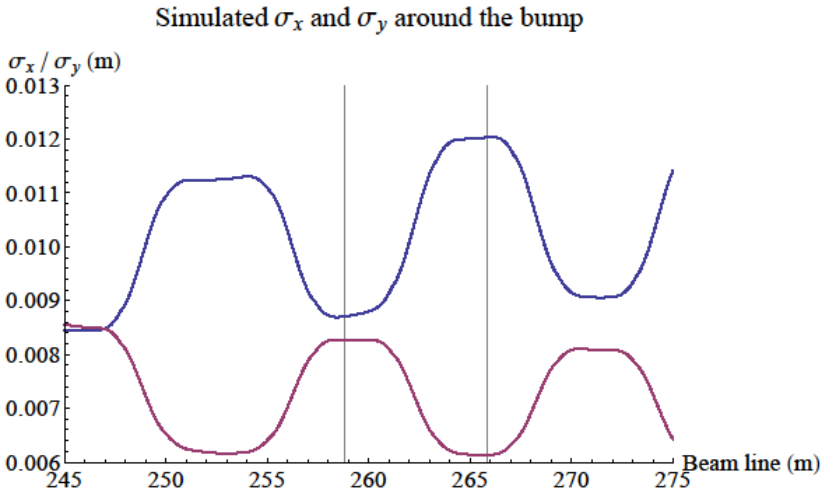
Mad-X Simulation of the closed orbit

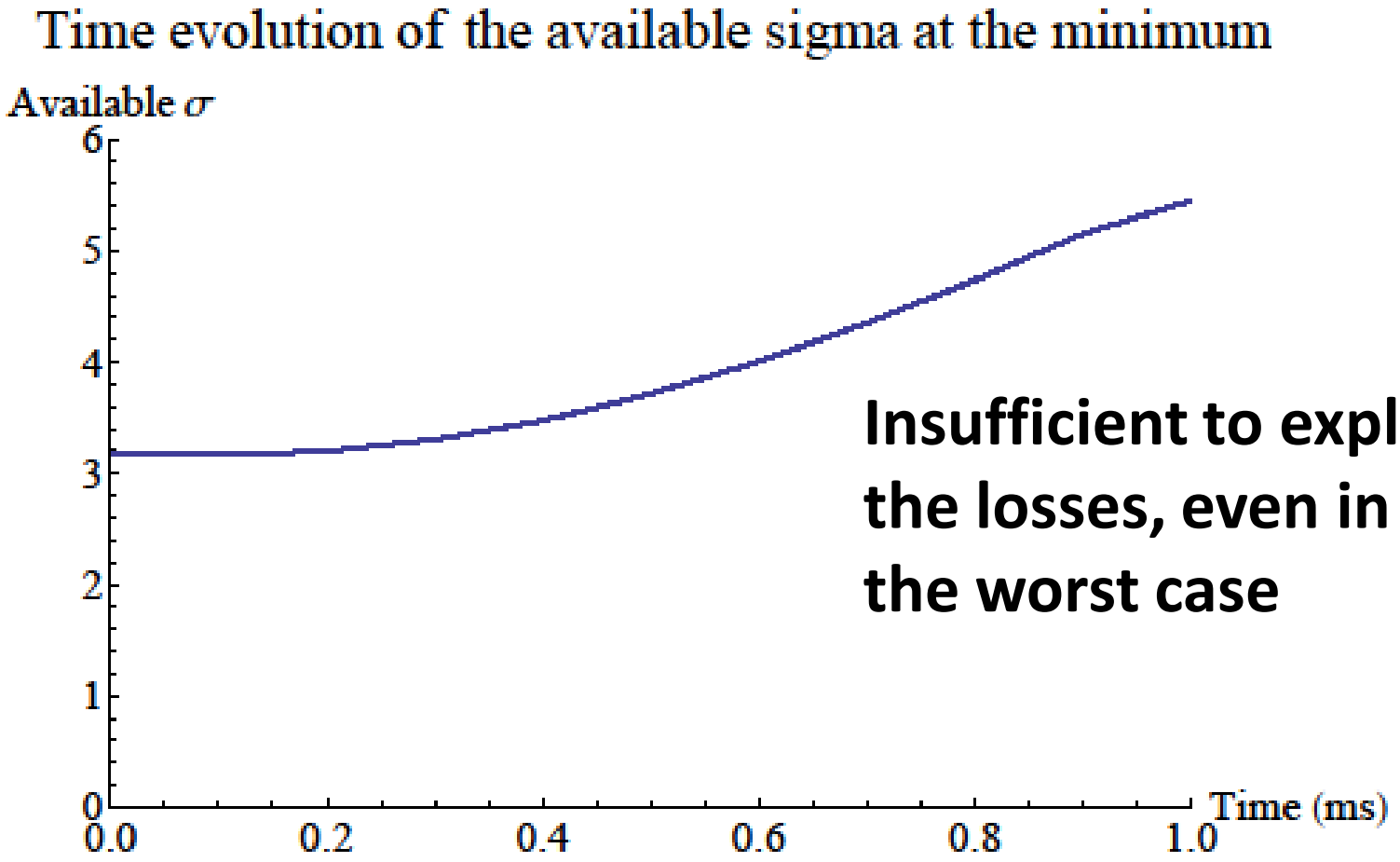


1σ beam enveloppe

Only maximum and minimum of the bump can lead to aperture restriction

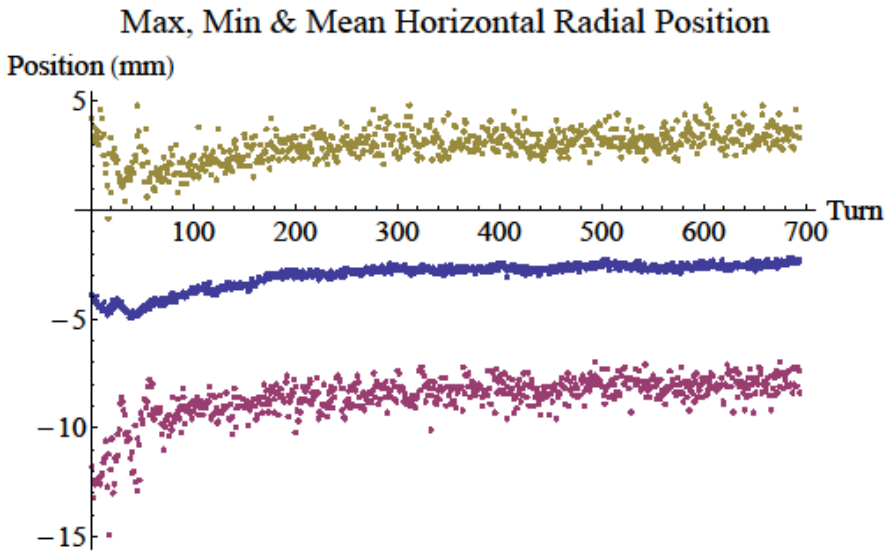


Available space without MRP

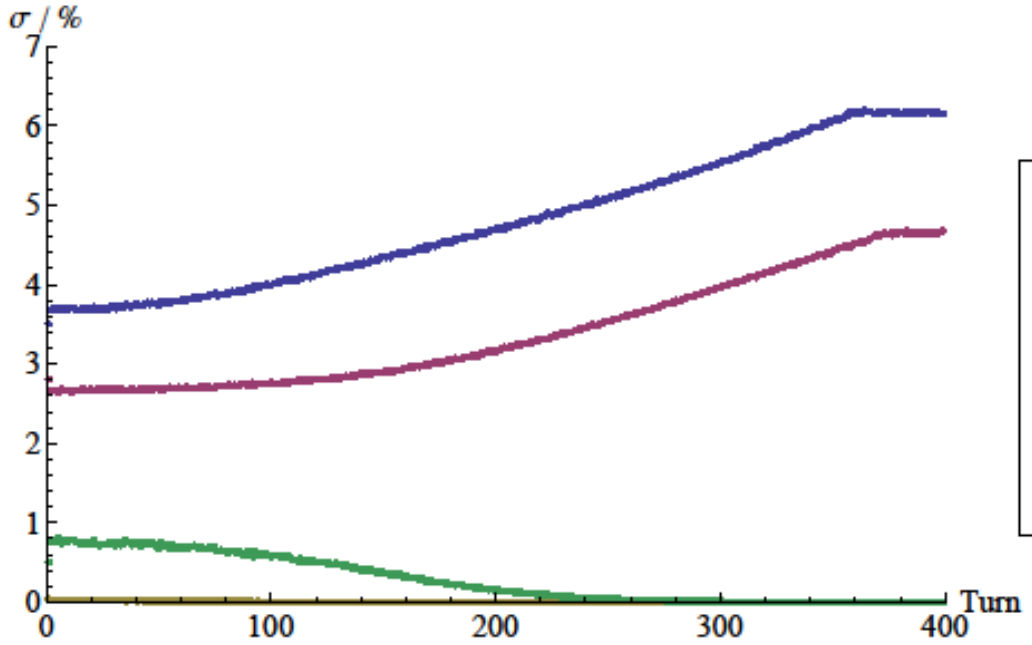


Insufficient to explain the losses, even in the worst case

Available space using measured MRP



Strongly negative MRP, decreases available space at the minimum and increases at the maximum. Misalignement of the septum 42 reduces available space at the maximum.



Space Charge Asymmetry

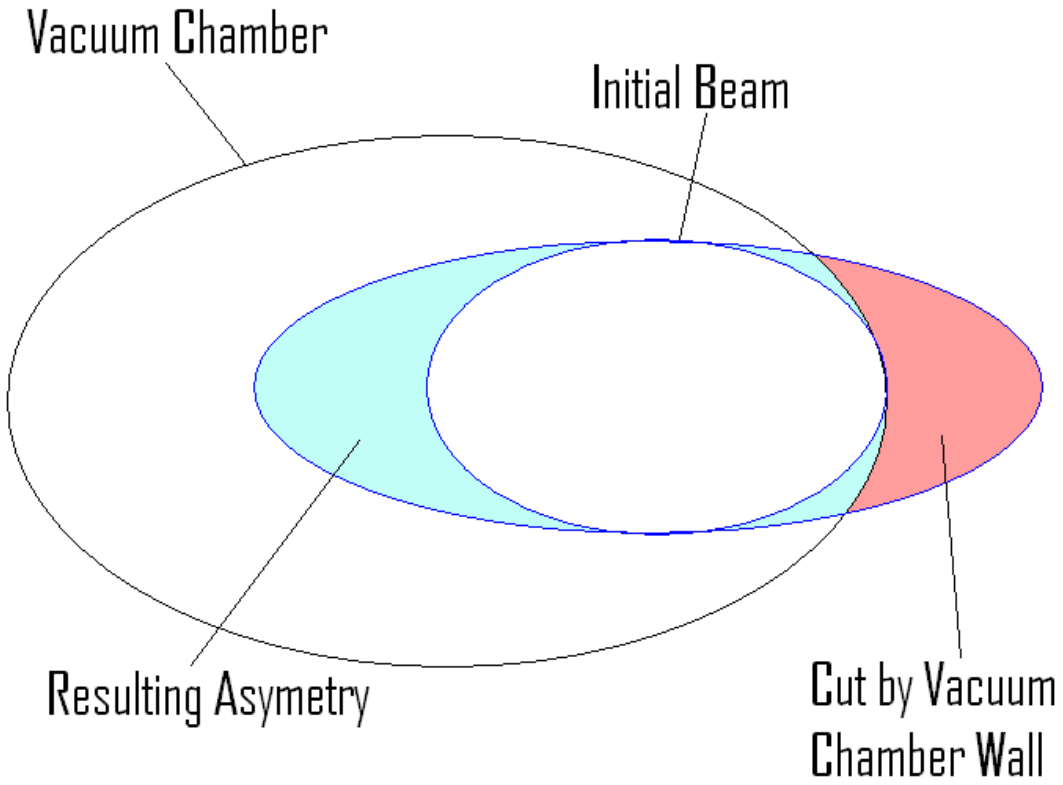
$$I_p = \beta c \lambda \approx 10A$$

$$F = \frac{eI_p}{2\pi\varepsilon_0 \beta c \gamma^2} \frac{1}{4r}(1 - e^{-r^2/2\sigma^2}) \approx 3.4 \times 10^{-16}\, N$$

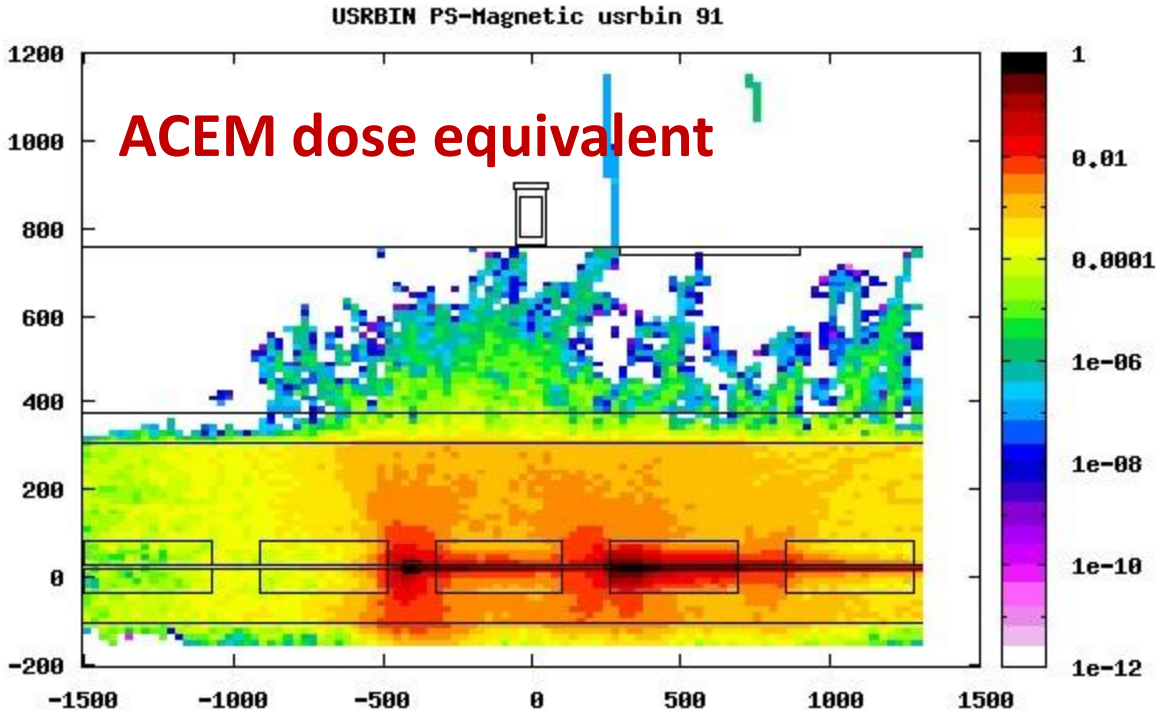
$$C = 0.01$$

$$t = N \times 2.2 \times 10^{-6}\, s$$

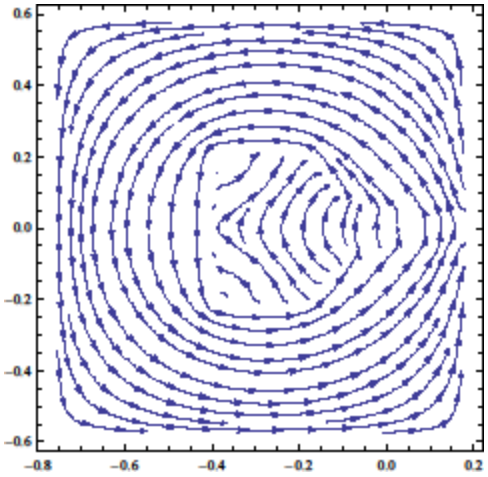
$$d = 0.5Cat^2 \approx N^2 \times 0.2mm$$



Fluka simulation with magnetic field



Measured magnetic field read into the simulation with a fortran script.

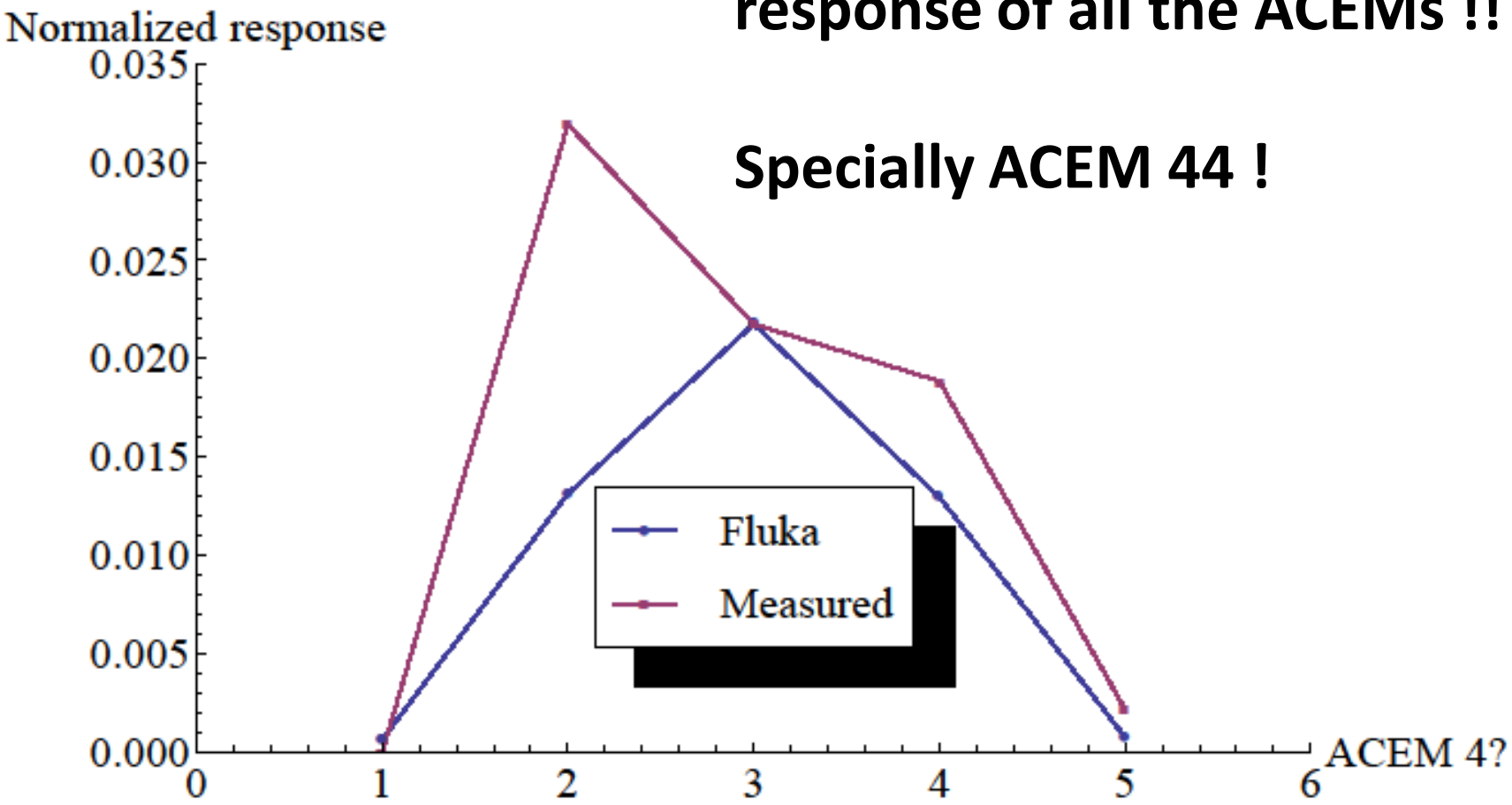


Simulation with sources at the maximum and minimum of the bump.

Normalized ACEM response

Difficult to reproduce the response of all the ACEMs !!

Specially ACEM 44 !



LHC-BLM Fluka model

Momentaneously working on the inclusion of the model into Sanja's simulation.

Will be used to verify the BLM data with simulation and find the optimal position.

Thanks a lot to **Javier Barranco Garcia** for his help with Mad-X and **Olav Ejner Berrig** for the aperture model.

Thanks a lot to **Oliver Hans** for his help during data taking.

Thanks a lot to **Sanja Damjanovic** for her Fluka model and all the help.

Special thanks to **Roderik Bruce** for his magnetic field routine and all the help with technical problems.

Thanks a lot to **Alessio Mereghetti** for the LHC-BLM model.