Source foils bending measurements

2026/07/02 Collaboration meeting, Bratislava

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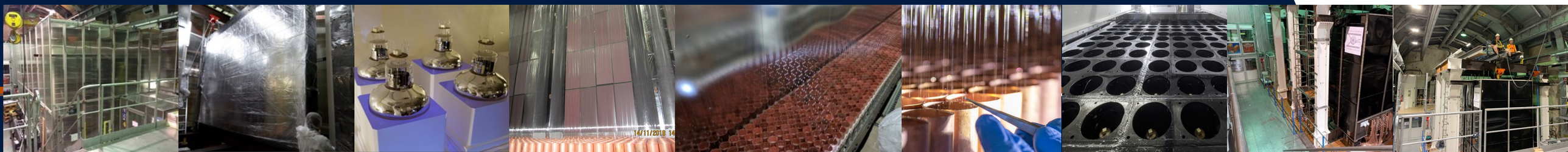
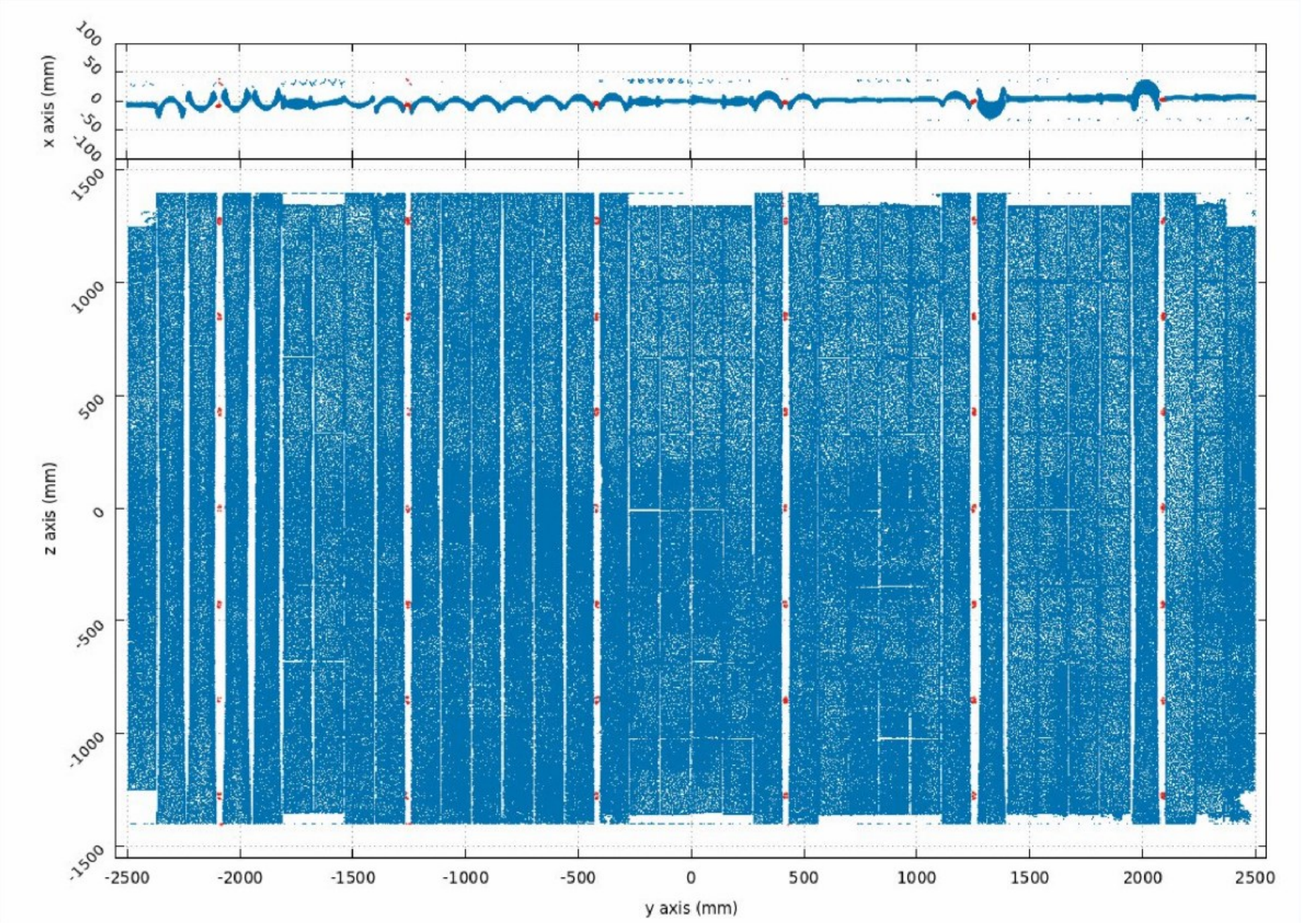


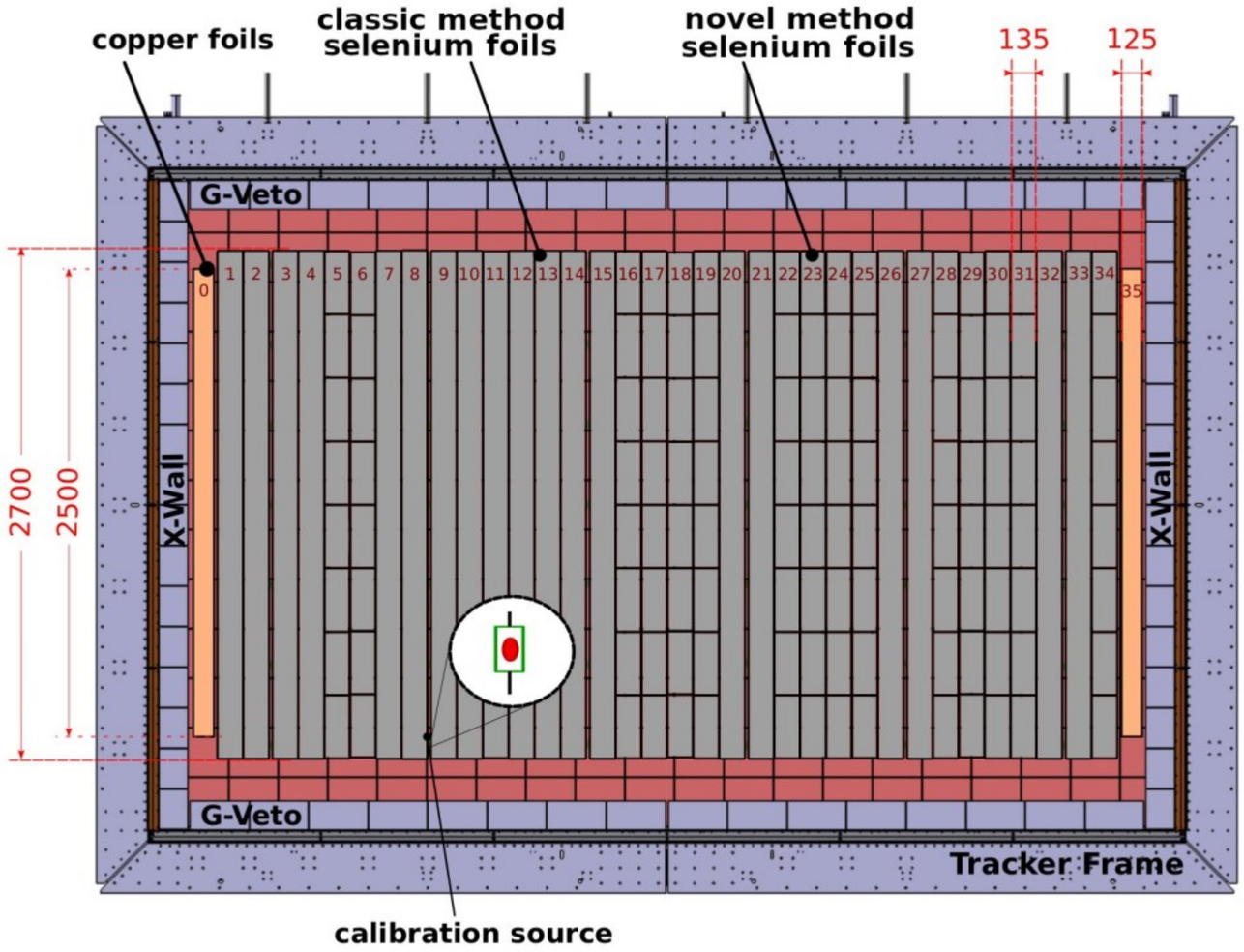
Bending ^{82}Se foil: measurement

Can we measure precisely the curvature of the 82Se foil using tracking ?



- ^{82}Se curvature has been measured by laser scan in 2019
- Realistic source foils geometry in Falaise based on theses measurements **not for LAPP foils**
- Does the curvature change since 2019 ?

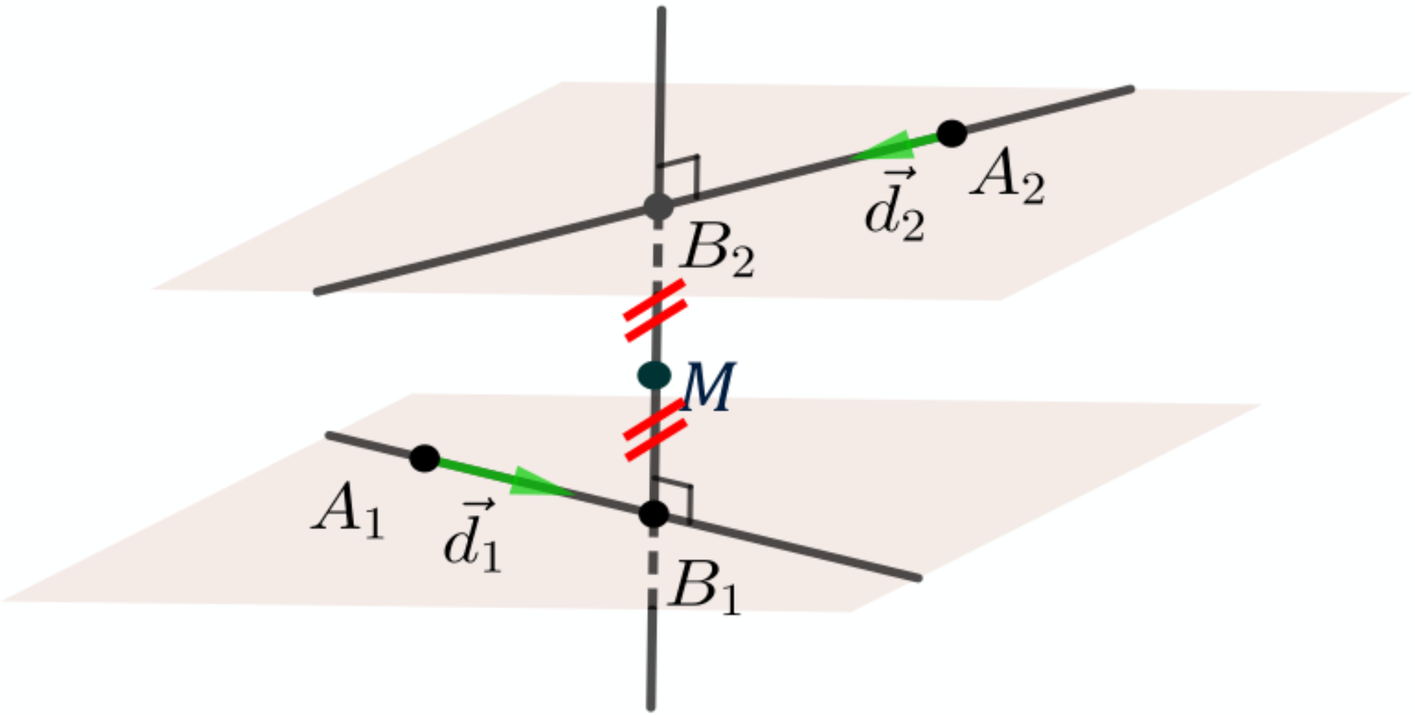
Bending ^{82}Se foil: measurement



I'm using the same axes references and same foils number

Vertex reconstruction methods

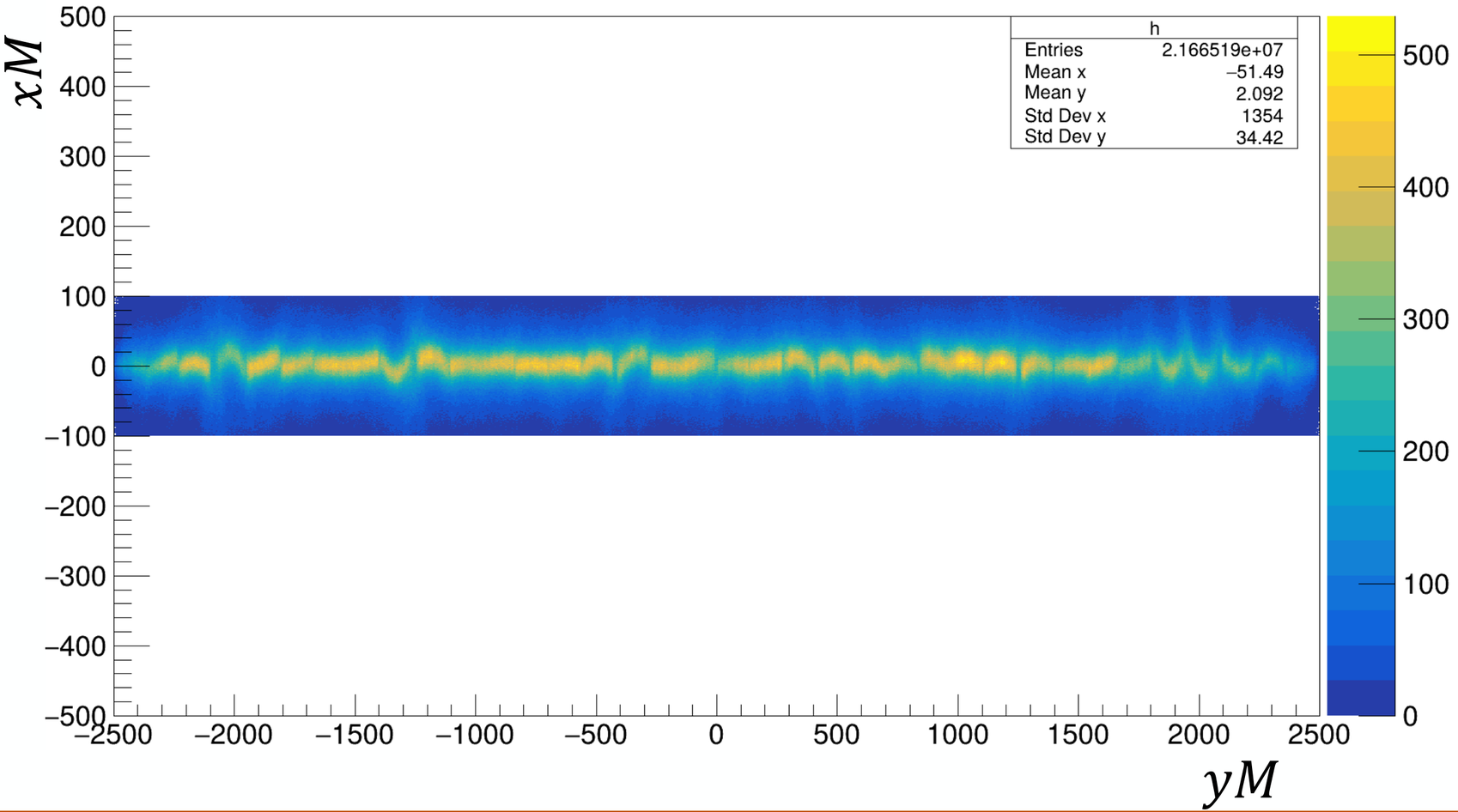
Need 2 tracks with fit

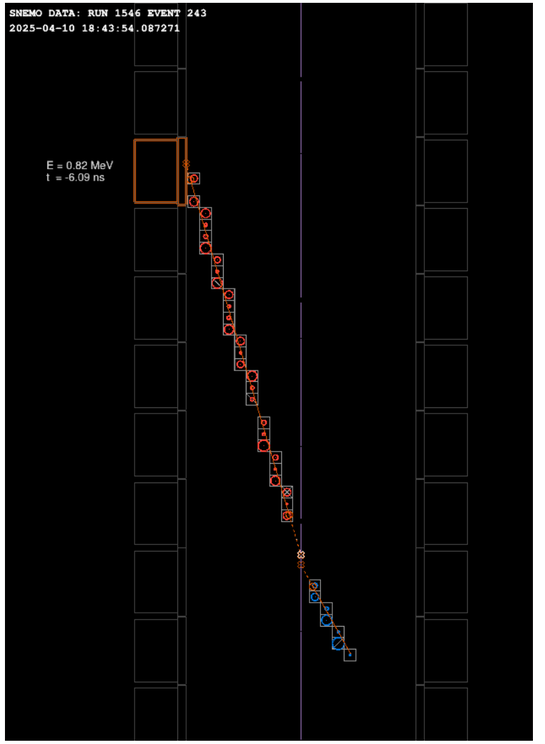


Vertex determination: Searching the closest equidistant point between two track fit lines

$$M \begin{pmatrix} xM \\ yM \\ zM \end{pmatrix}$$

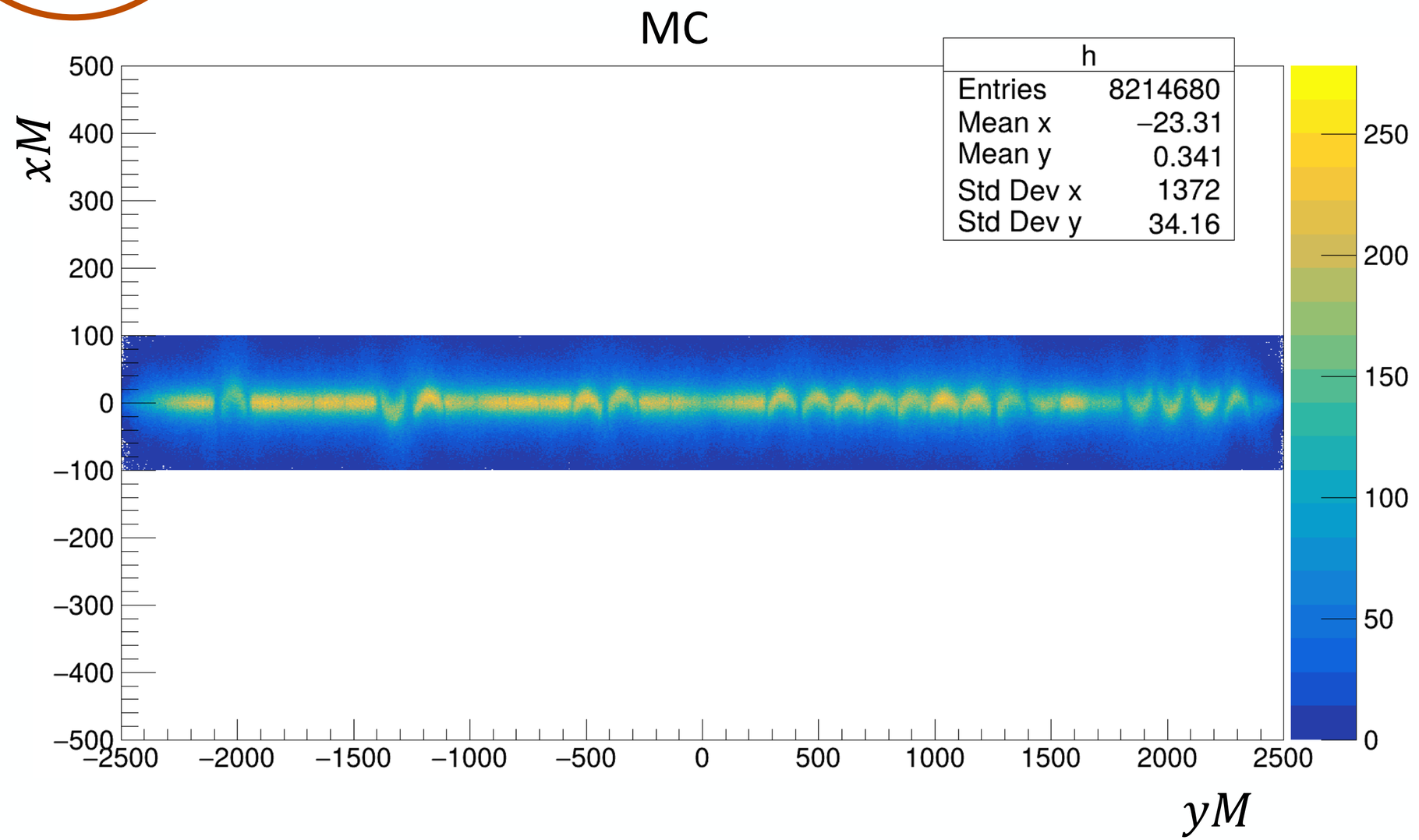
Source foils measurement





Electron crossing sources foils vertex reconstruction

Source foils measurement

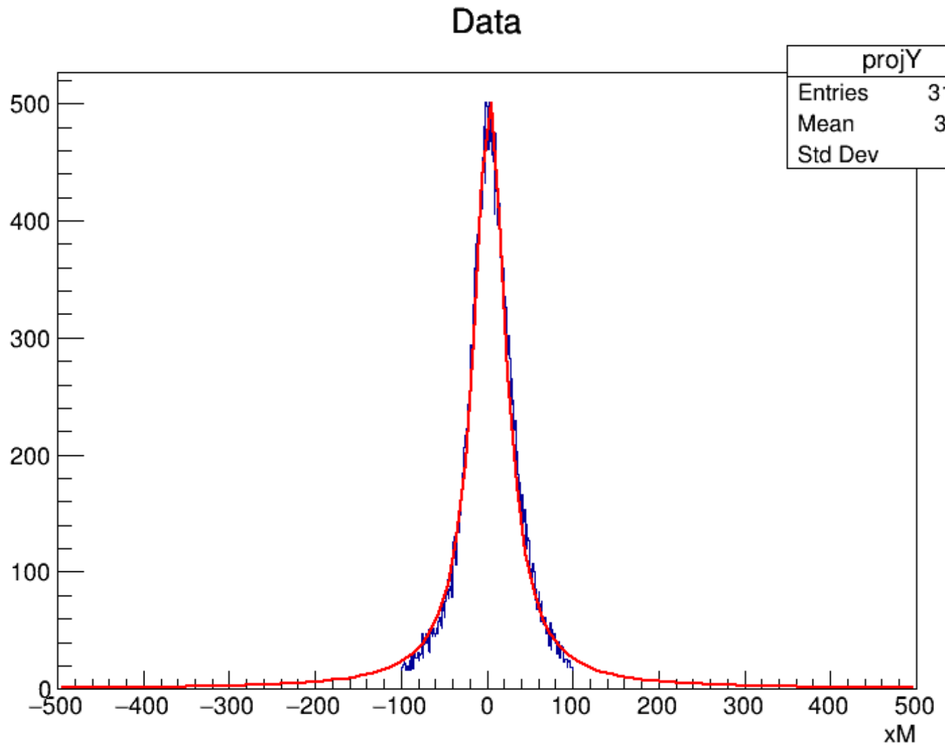


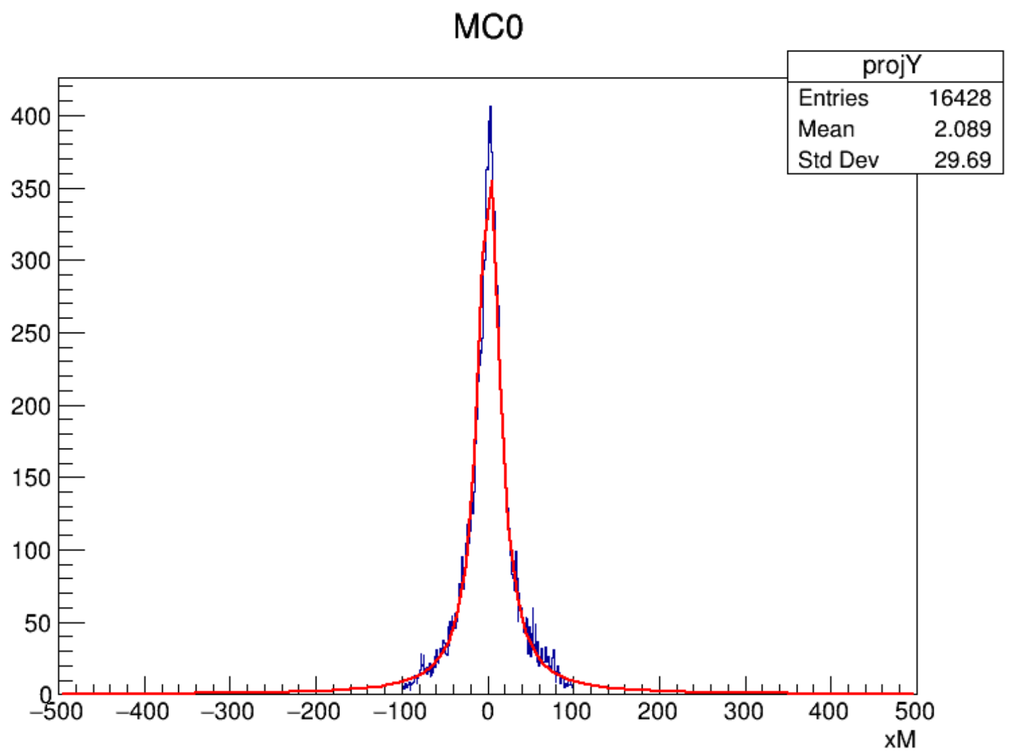
BiPo vertex reconstruction

With BiPo MC from field wires surfaces

Lorentzian fit on each x axis bin

Lorentz fit function



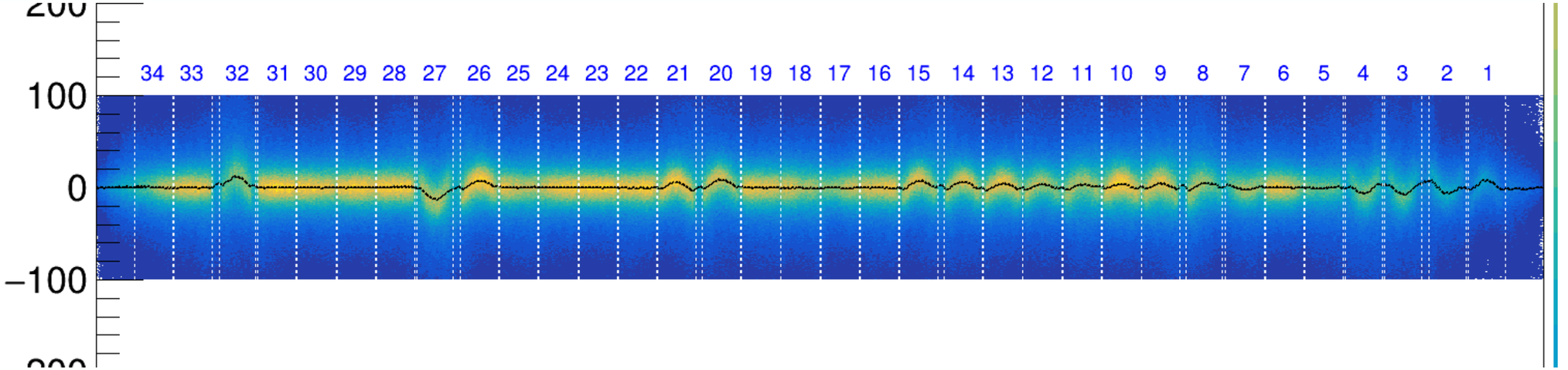


Extraction of the Lorentzian function mean value

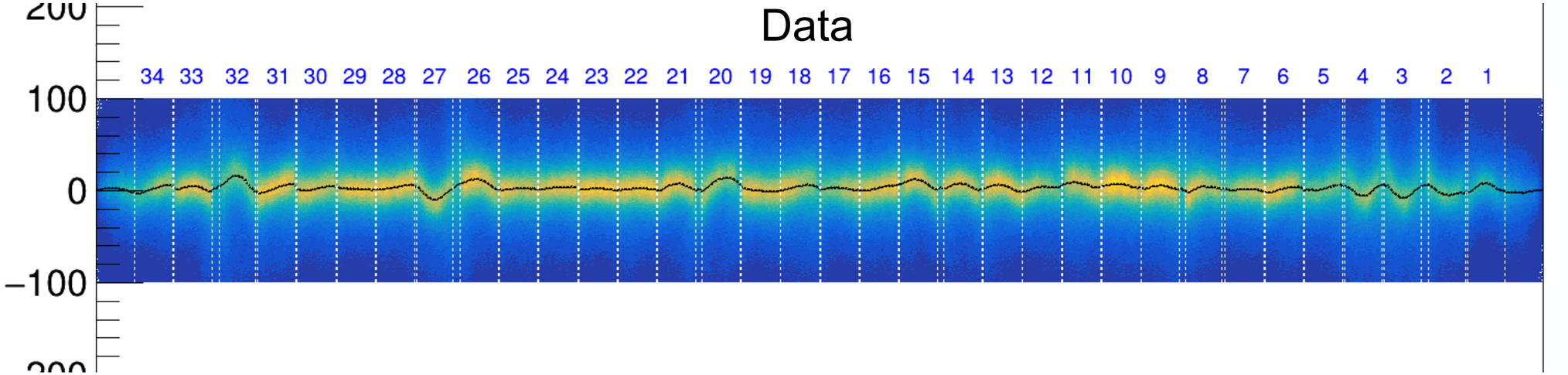
Profile x,y of source foils

Projection on each bin

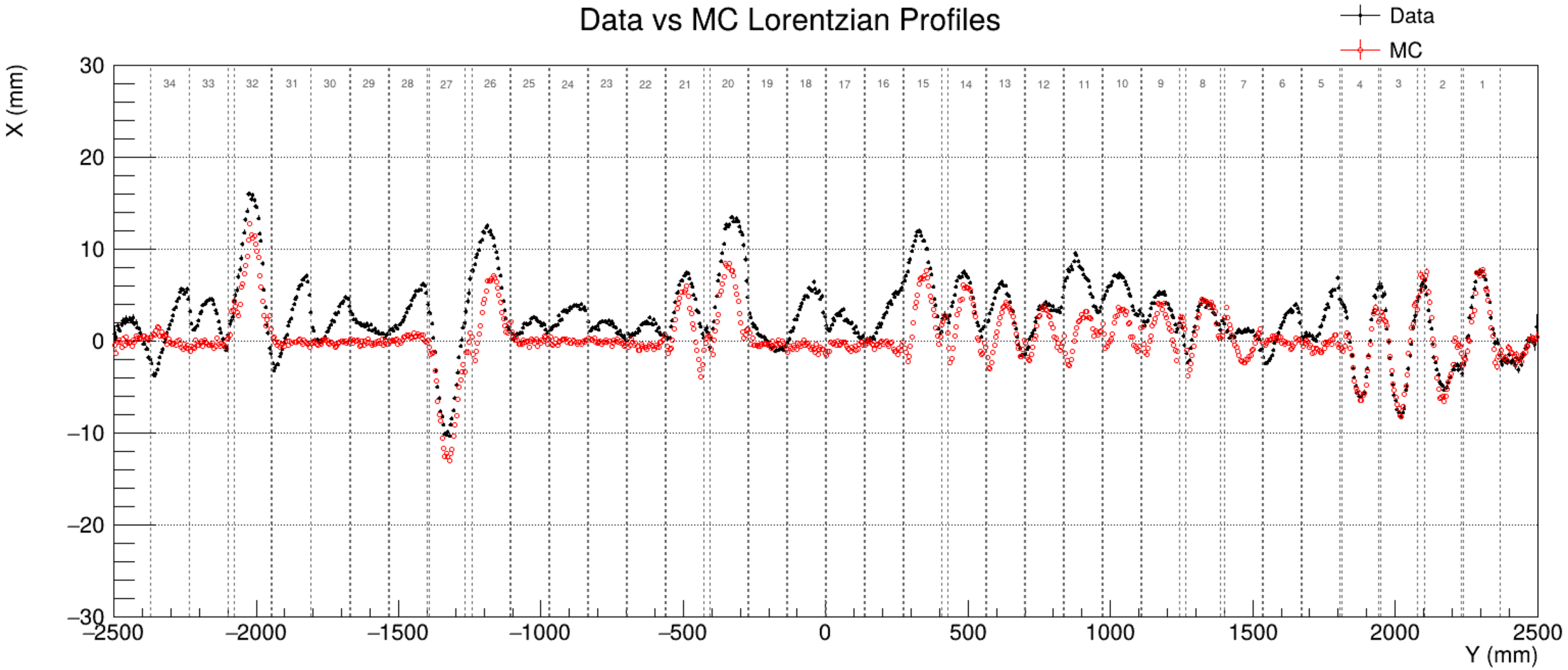
MC



Data

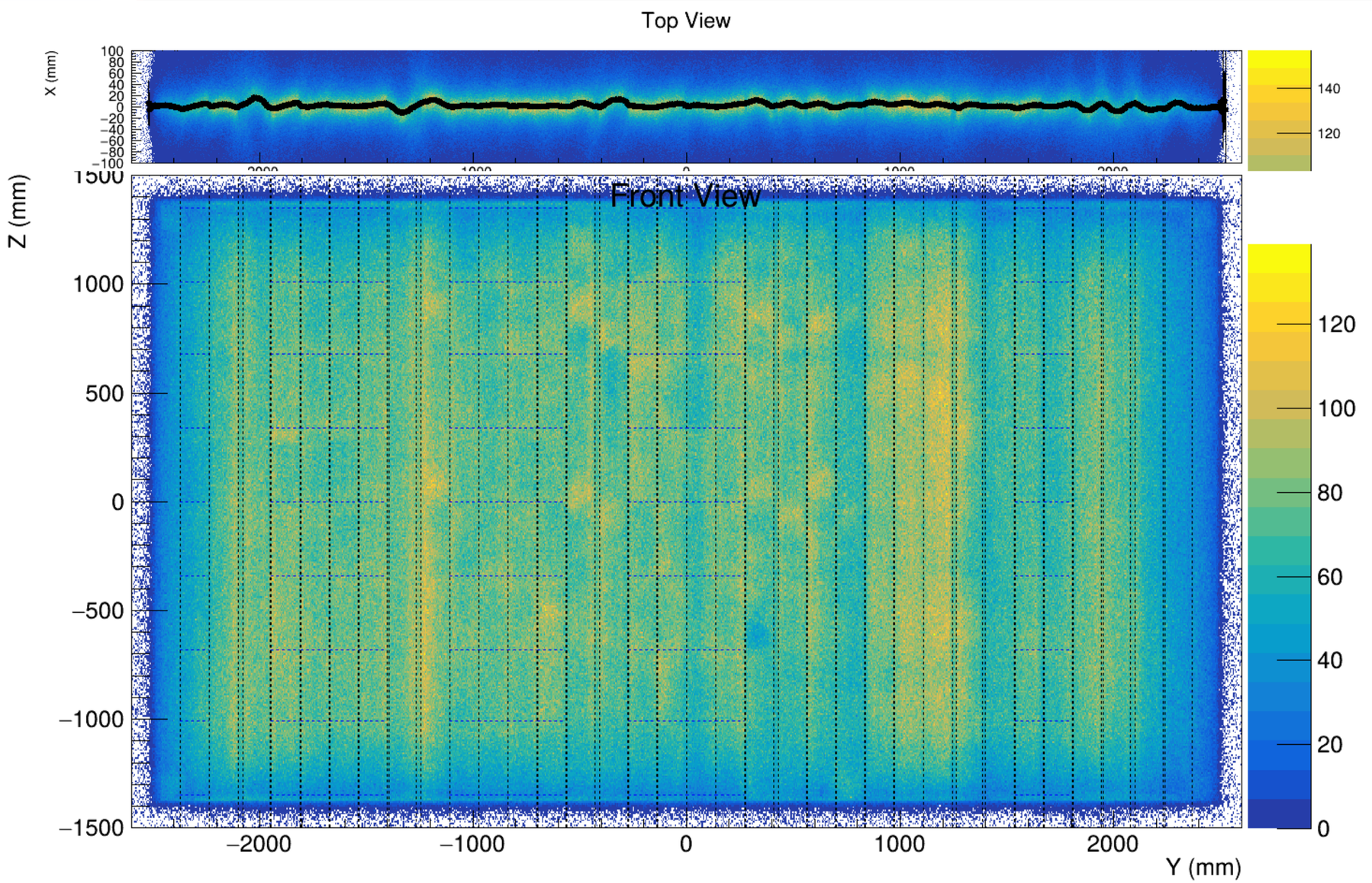


Profile x,y of source foils



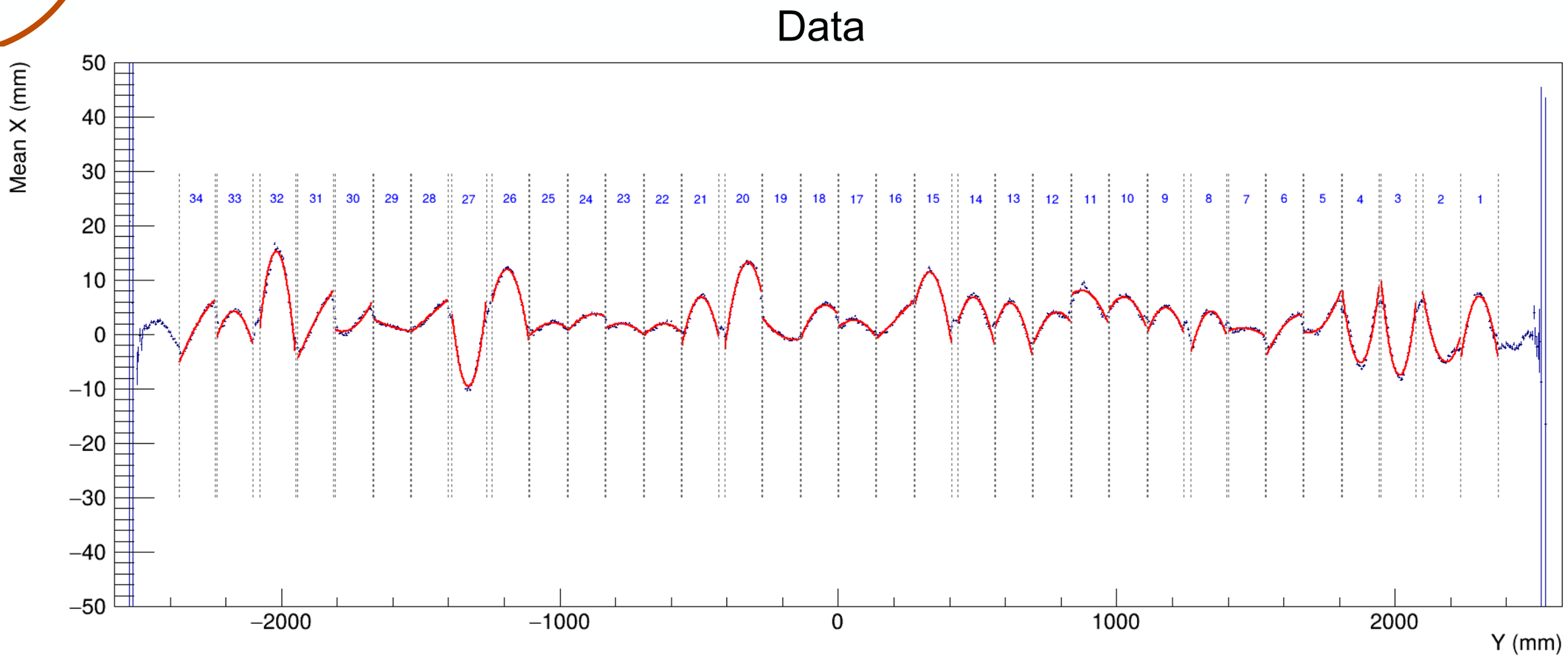
Discrepancy between data & MC

Source foils profile



I need to understand why it's not homogeneous…

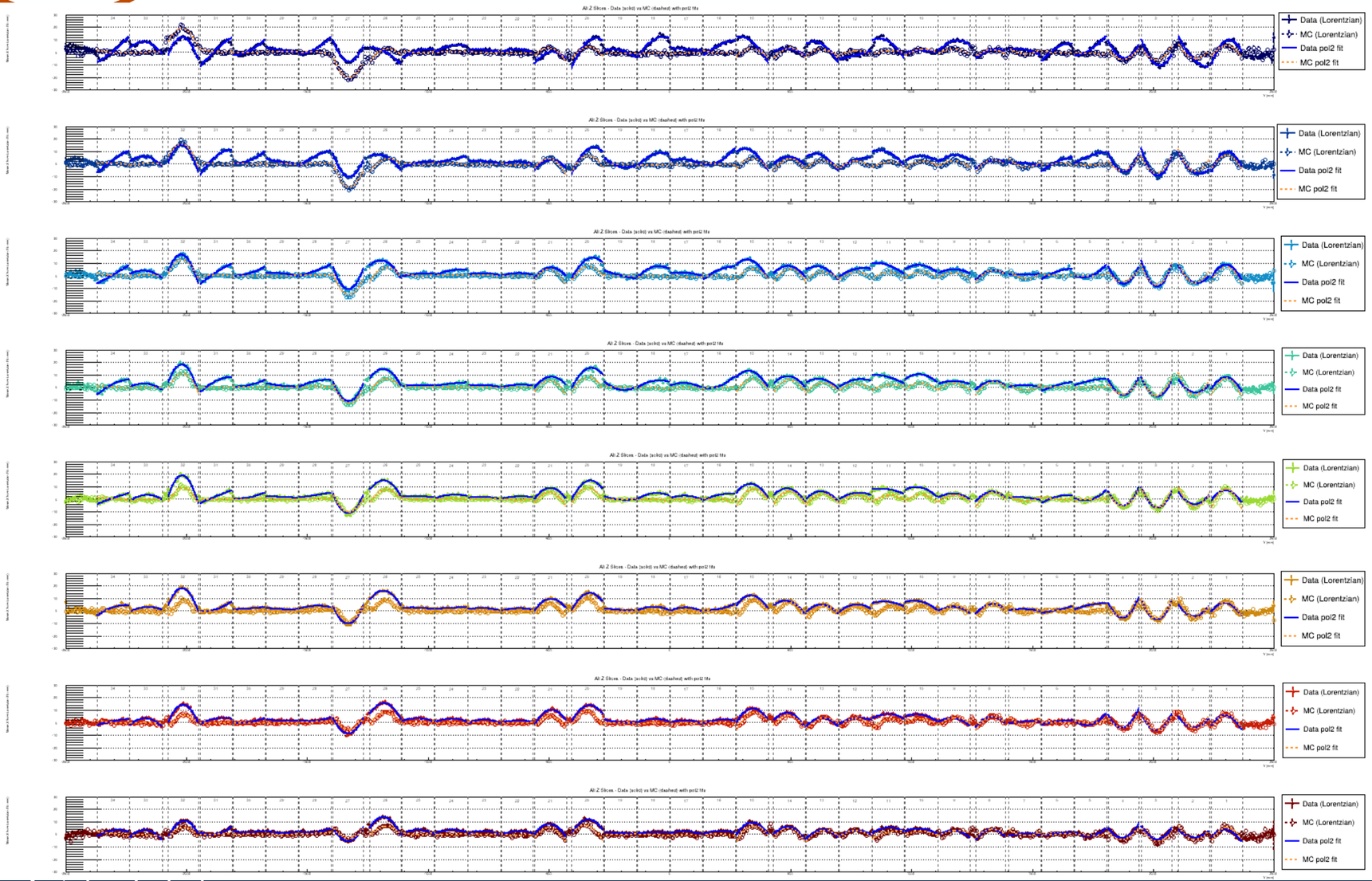
Source foils profile fit



Fit with polynomial order 2 function on each foils
Cu foils are bended too
Table of fit parameter will be updated on DocDB

Source foils profile over z

Data & MC



We can see different bending over z axis

Table of fit parameters in docDB will be updated

Conclusion

- We can measure source foils geometry
- Polynomial function order is enough to build geometry in Falaise ?
  ➔ Need to check Chi2 distribution of all foils fits
- Do you have any ideas to improve this analysis ?

Thanks for listening