

Bologna NTD Group Status Report

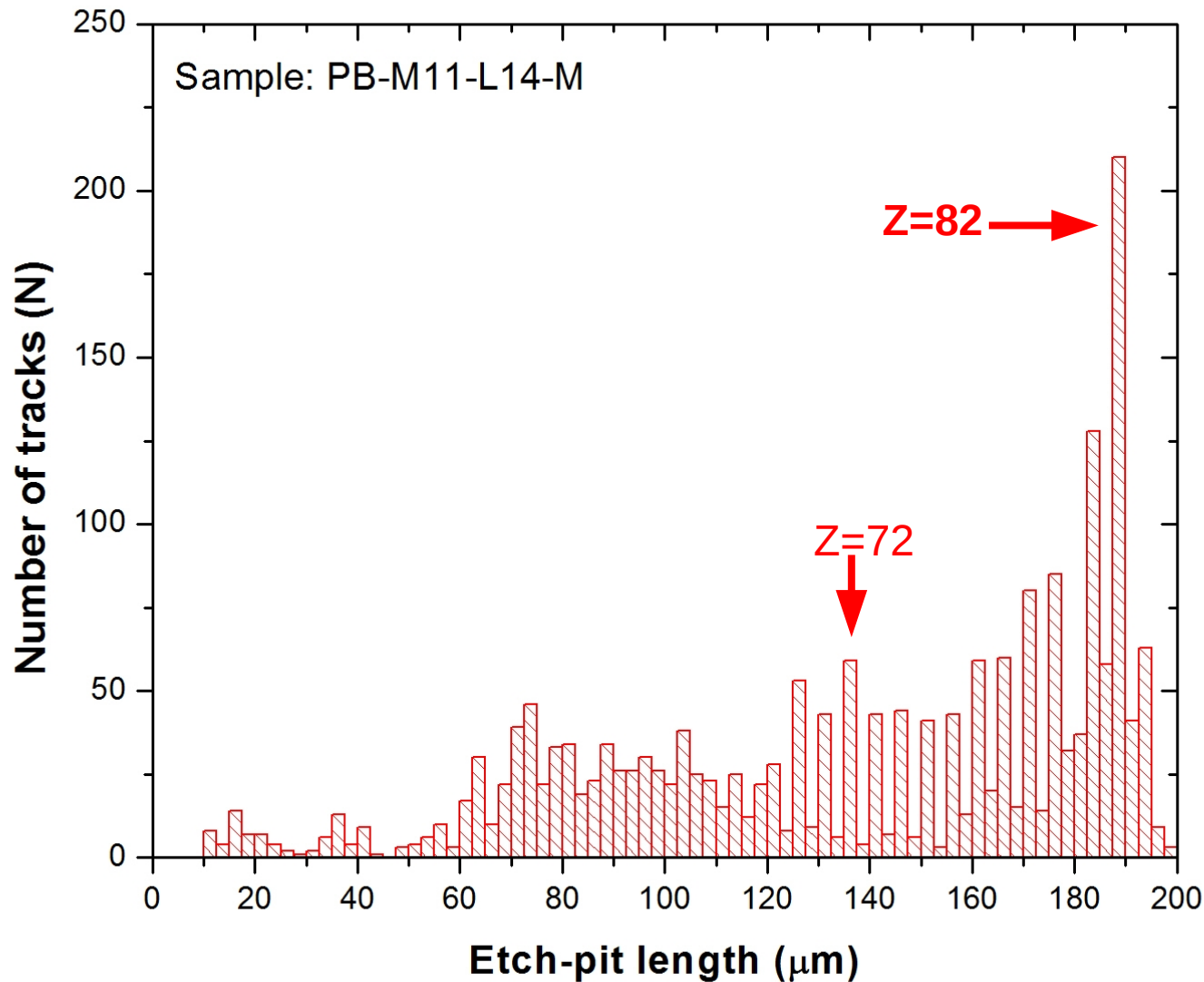
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Date: 7 Feb. 2020

Calibration of Makrofol

Etch-pit length distribution of Pb fragments

Etchant: 5.5 N KOH + 20% Ethyl Alcohol at 45°C; Duration 7 h

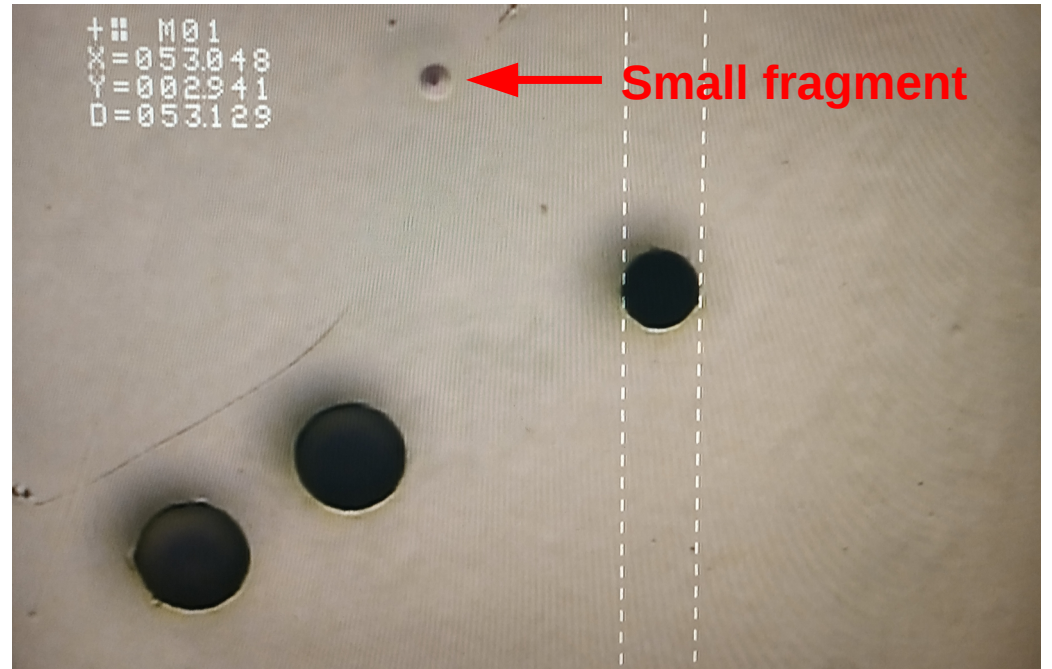
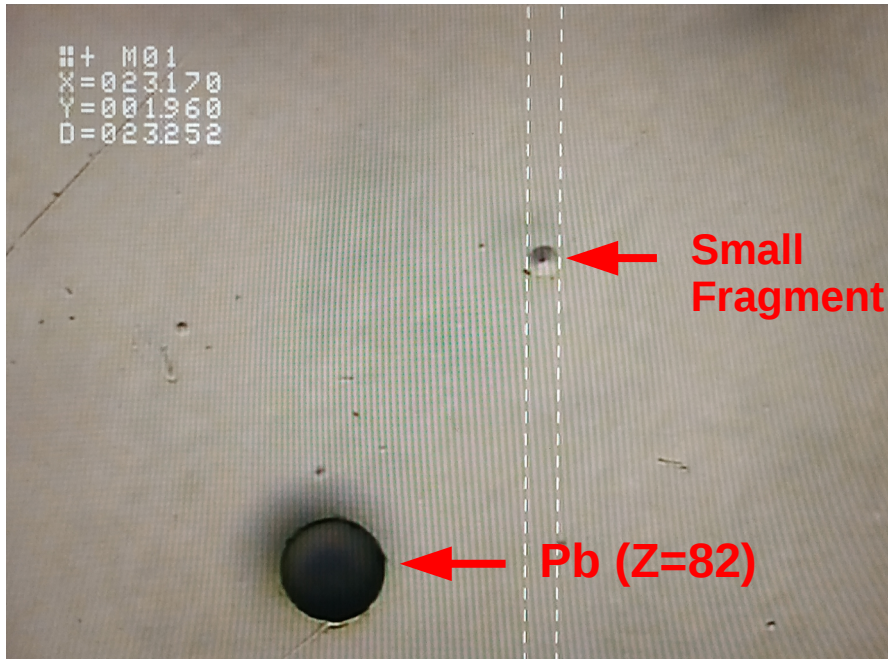


Determination of '**Practical**' Detection Threshold for Makrofol EXPOSED in MoEDAL

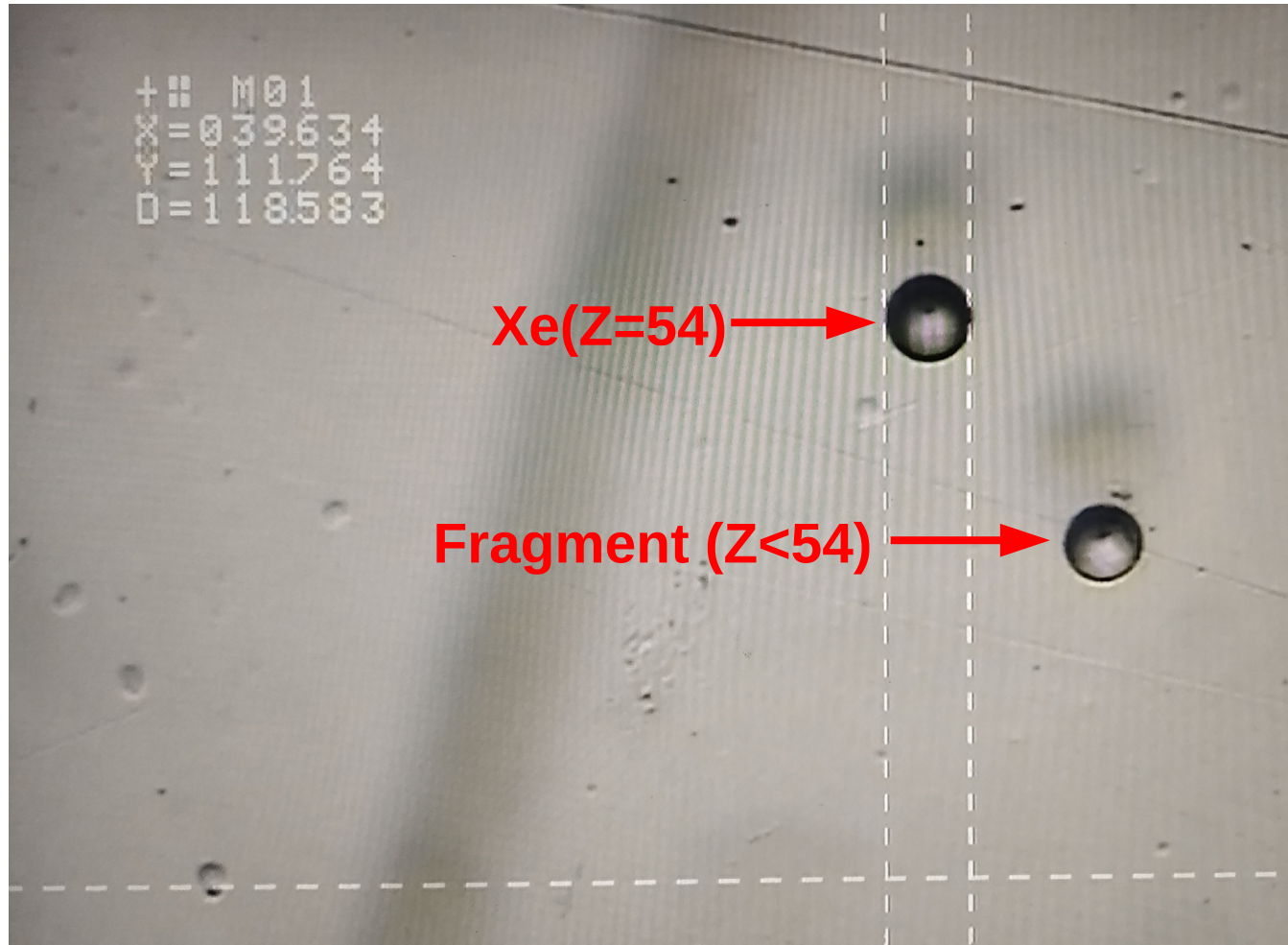
- The **charge of the smallest through going fragment** that can be visually identified against the MoEDAL background of other tracks is the 'practical' detection threshold.
- To find the practical detection threshold, first we need to obtain the diameter distribution of Pb and Xe fragments on Makrofol NOT exposed in MoEDAL.
- In the next step, the diameter distribution of Pb fragments on Makrofol previously EXPOSED in MoEDAL are to be plotted and the charge of the smallest fragments ascertained by comparison with distributions obtained in the previous step.
- We have to rely on diameter measurements for this purpose, as for Makrofol EXPOSED in MoEDAL, etch-pit lengths are difficult to obtain as tips of etch-cone are not properly visible.

Pb and Fragments on Makrofol NOT exposed in MoEDAL

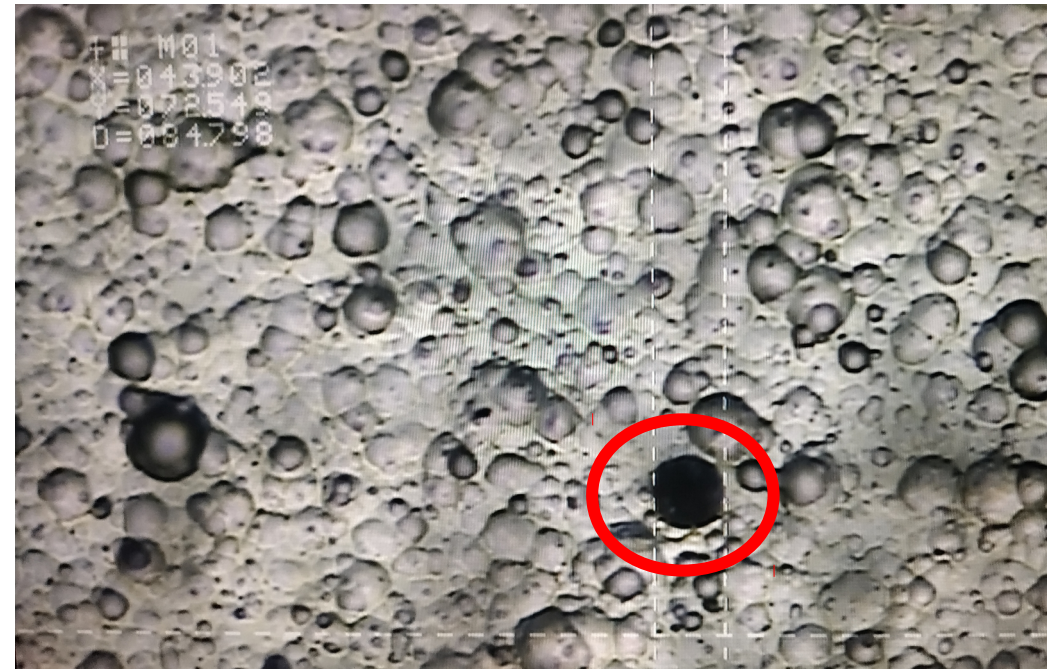
Microscope used : Jenatech, Total Magnification : 100x



Xe and Fragments on Makrofol NOT exposed in MoEDAL



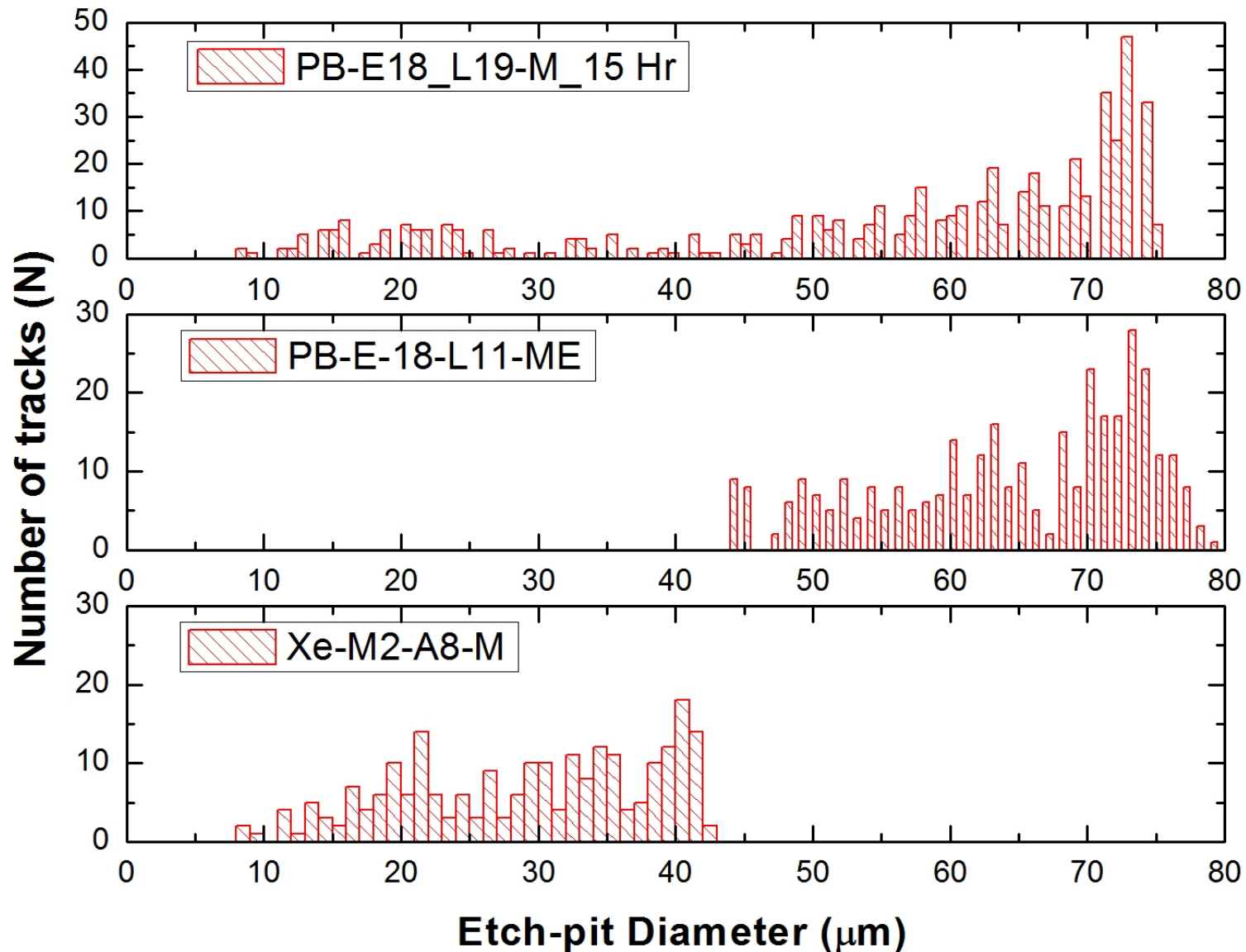
Smallest Pb fragments spotted (so far) on Makrofol EXPOSED in MoEDAL



Etch-pit diameter distribution on Makrofol

(Preliminary results)

Etchant: 5.5 N KOH + 20% Ethyl Alcohol; Duration: 15 h



Conclusion

- **Preliminary** investigations suggest that the smallest etch-pits corresponding to through going fragments that can be spotted on Makrofol EXPOSED in MoEDAL have diameters **slightly bigger** than that of Xe tracks
- This gives a hint that 'practical' detection threshold is somewhat higher than 54
- More data needs to be collected and more investigation of small fragments are needed before we can arrive at a definitive Z value for the 'practical' detection threshold.