Preparation and characterisation of a thin target for a nuclear physics experiment

Luísa Baptista
Supervisor: Pamela Teubig

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Introduction

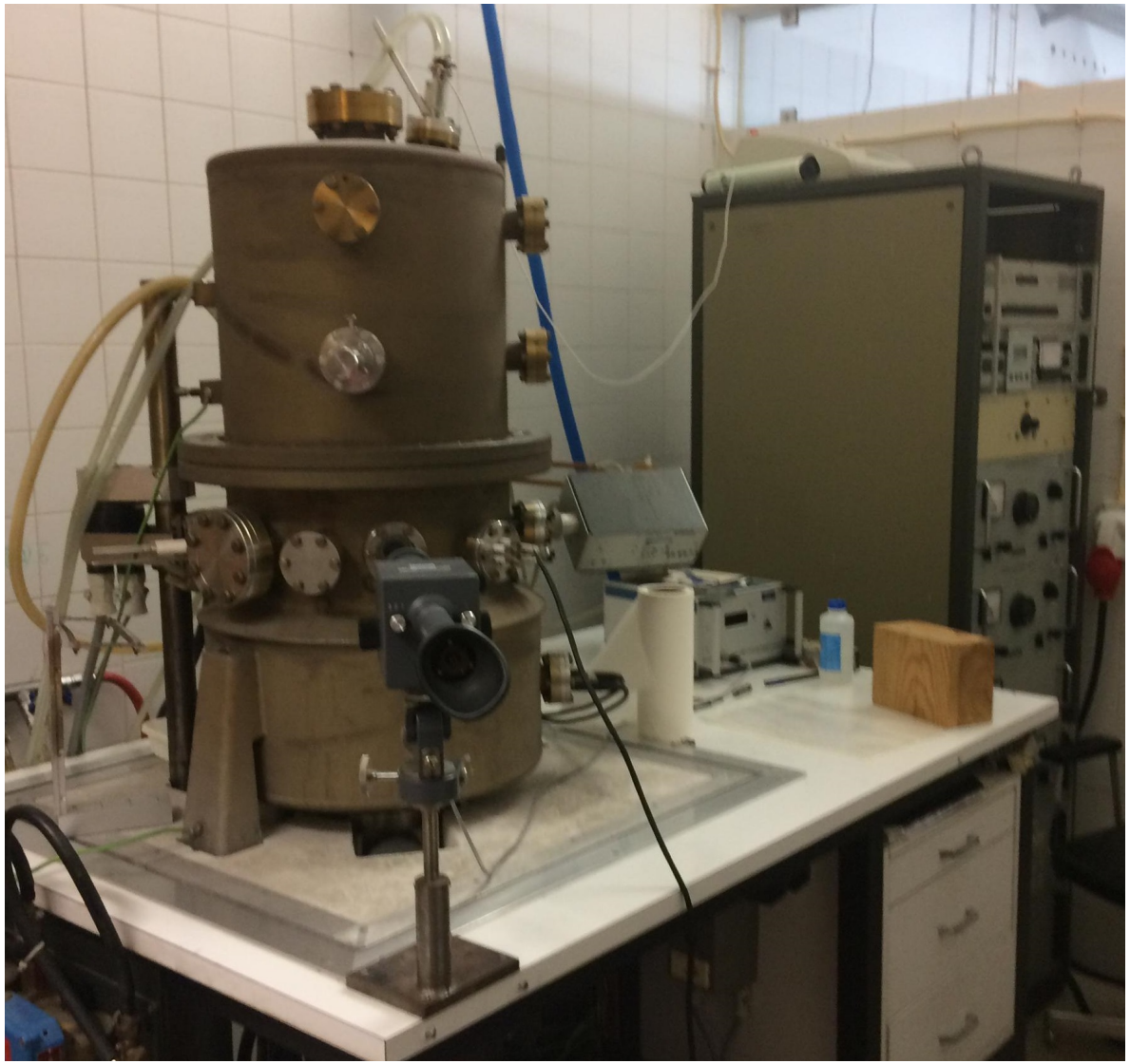
Targets used in nuclear experiments are subjected to bombardment by particles or radiation;

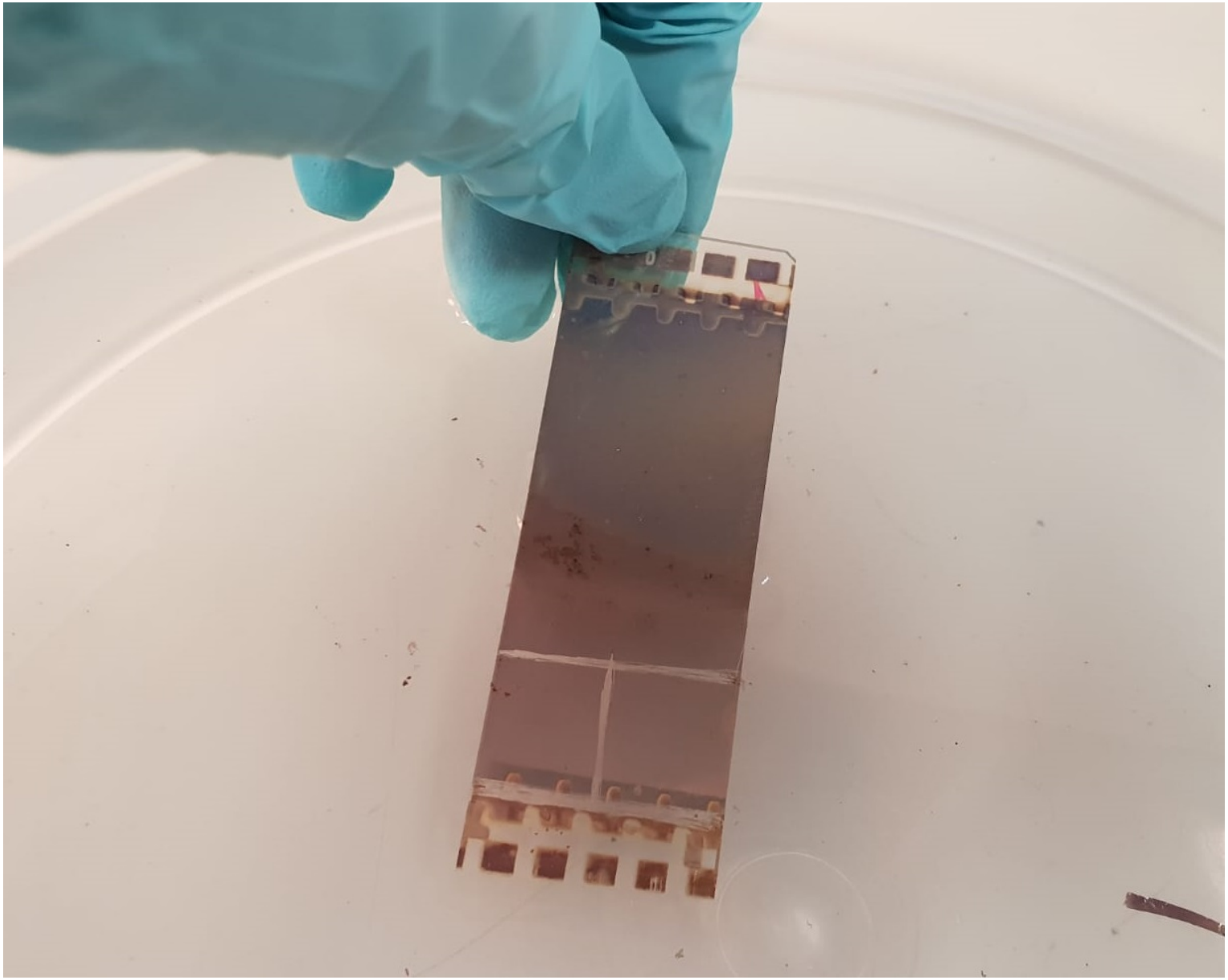
Important aspects of targets:

- uniform thickness
- good mechanical strength
- stability
- chemical and isotopic purity[1]

[1] Anna Stolarz. "Target preparation for research with charged projectiles". In: *Journal of Radioanalytical and Nuclear Chemistry*. 2013; A. H. F. Muggleton. "Deposition techniques for the preparation of thin film nuclear targets". In: *Vacuum* 37 (Jan. 1987).

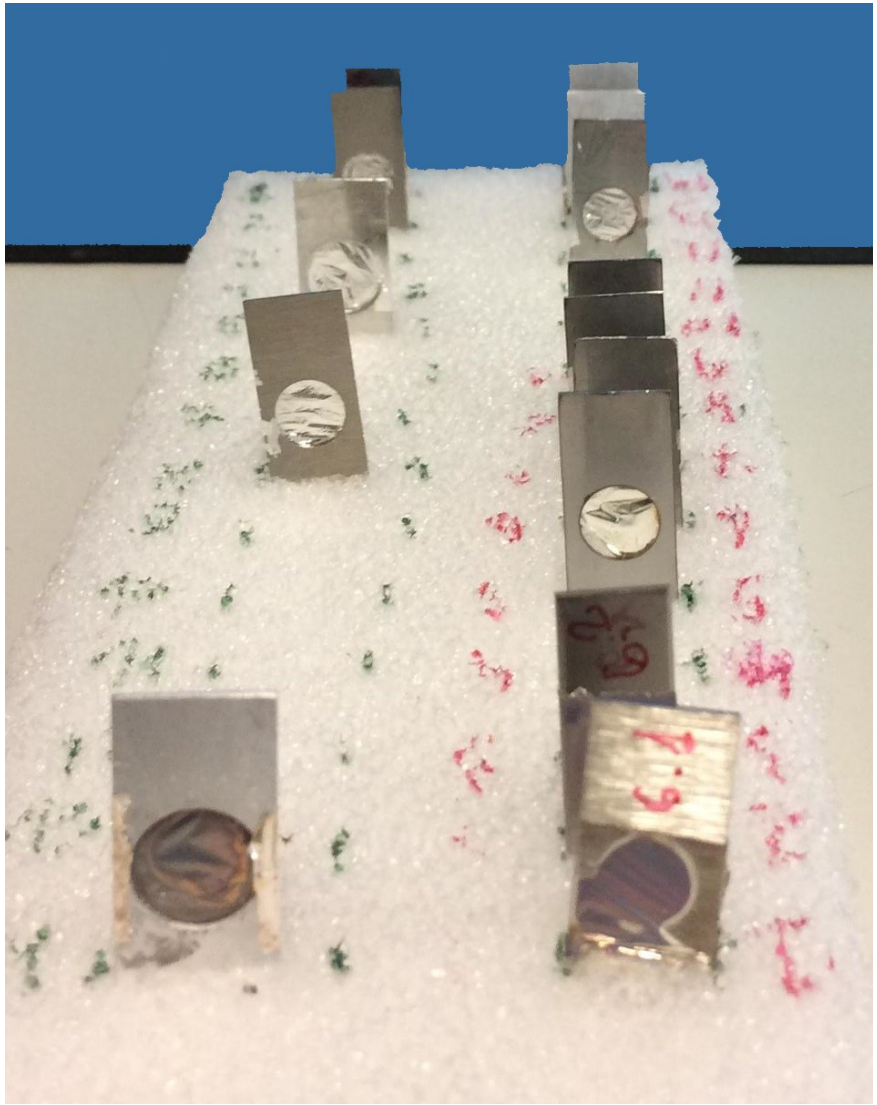
Vacuum evaporation



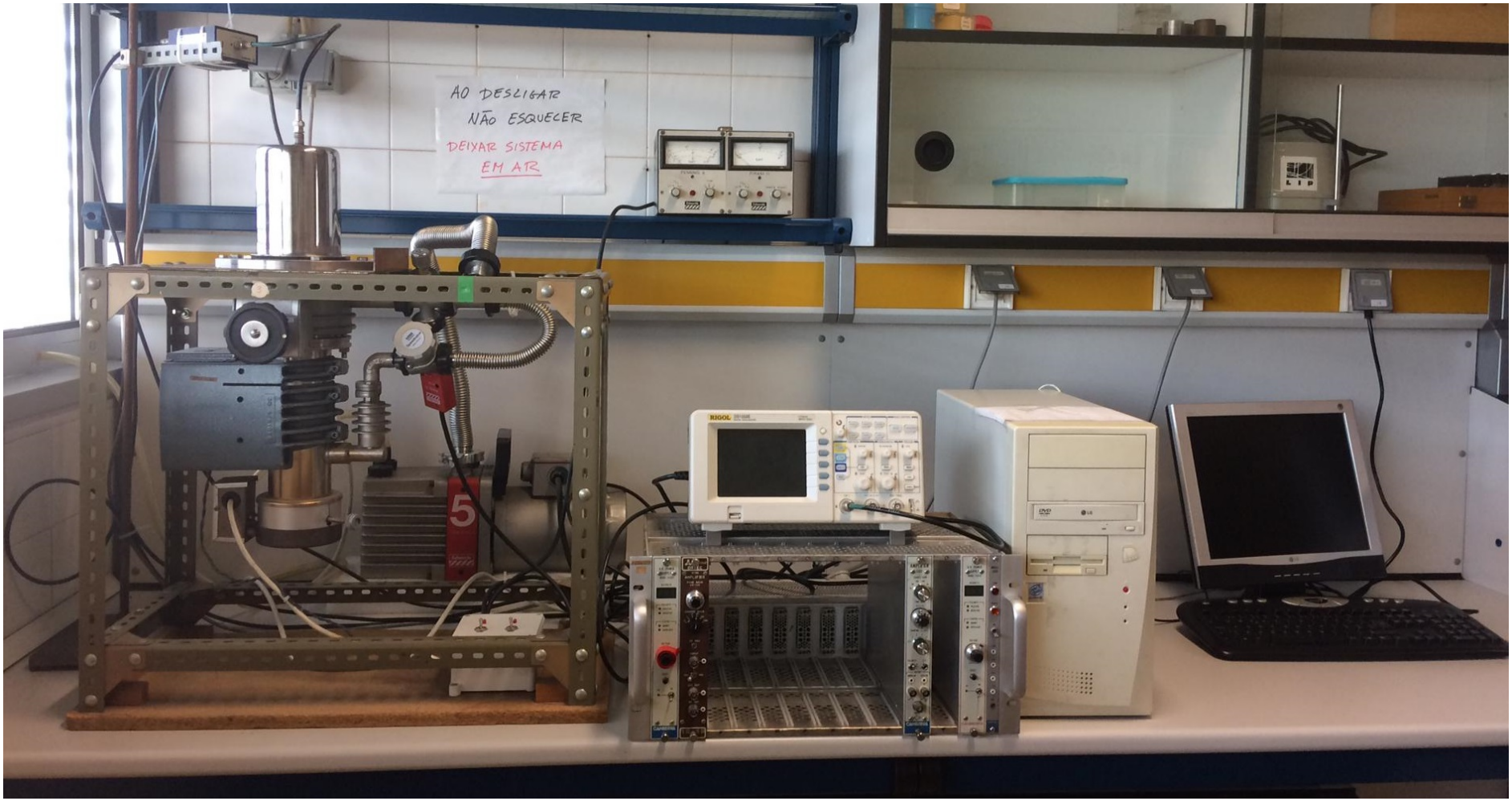


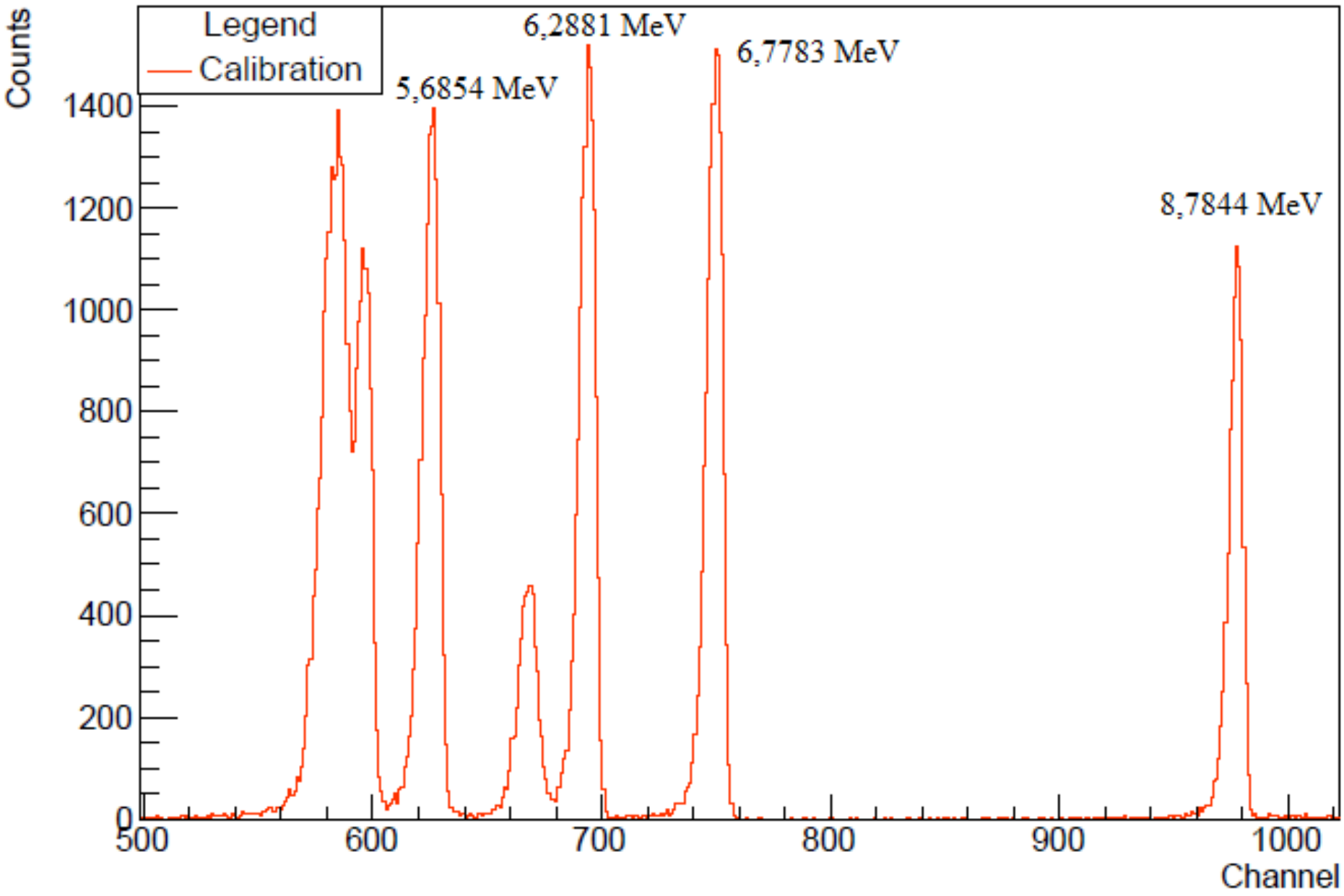
Production of the targets

The targets consist of AgCl on Ag support;



Alpha-particle analysis

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6,2881 MeV
6,7783 MeV
8,7844 MeV
Counts
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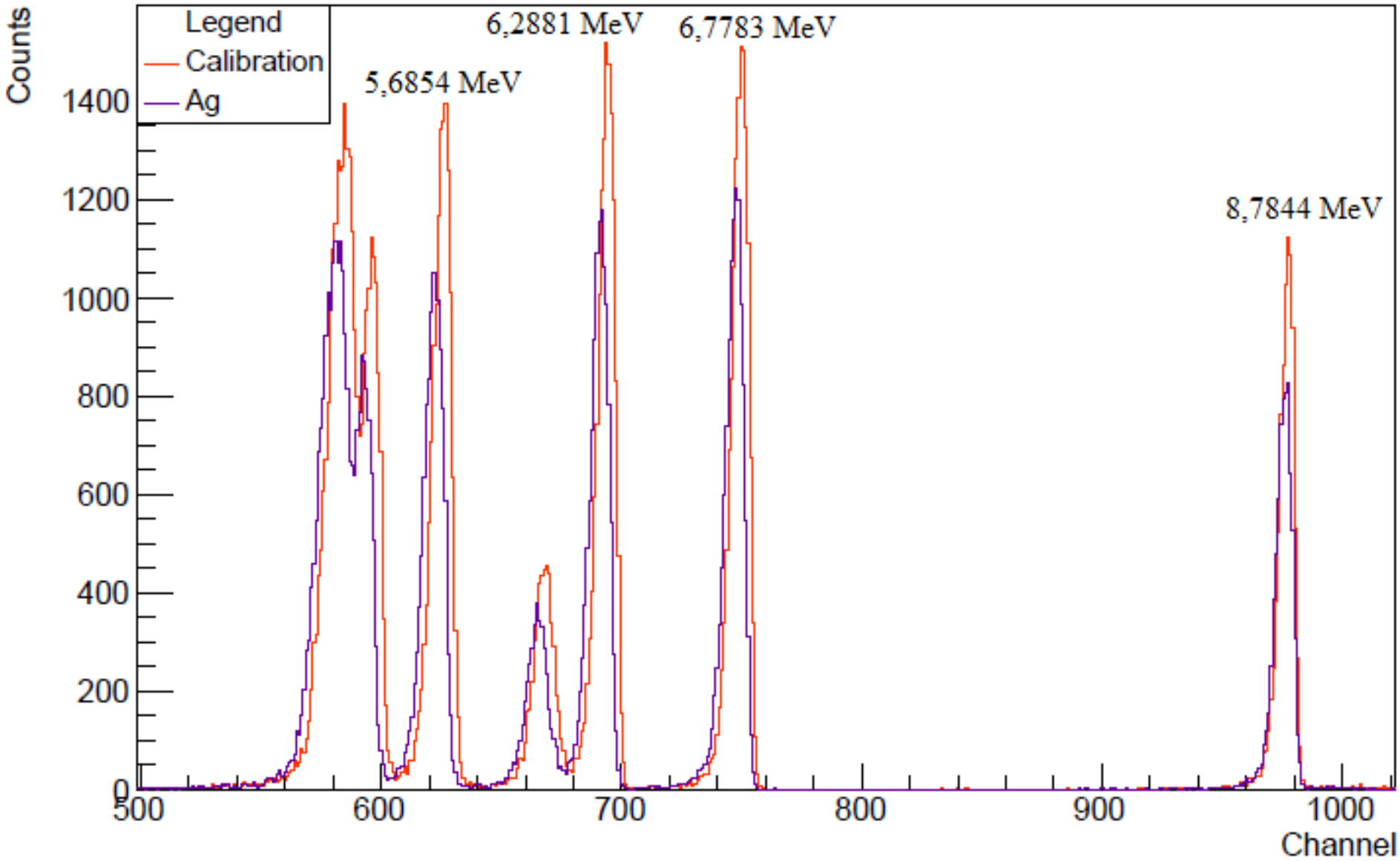
1200
1000
800
600
400
200
0
500
600
700
800
900
1000
Channel


Legend
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Ag
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6,2881 MeV
6,7783 MeV
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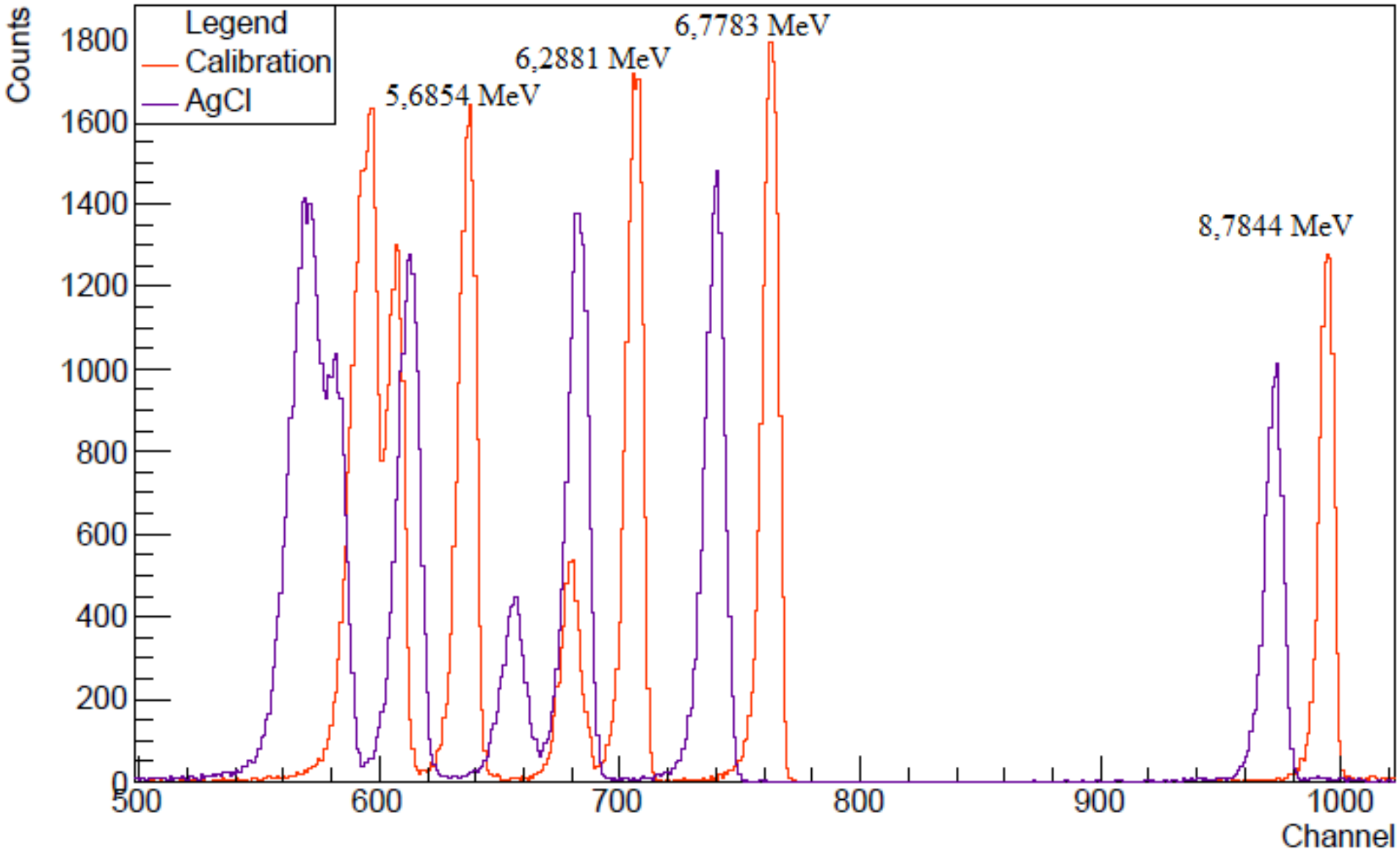
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Calibration
AgCl
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6,7783 MeV
8,7844 MeV
Counts
Channel
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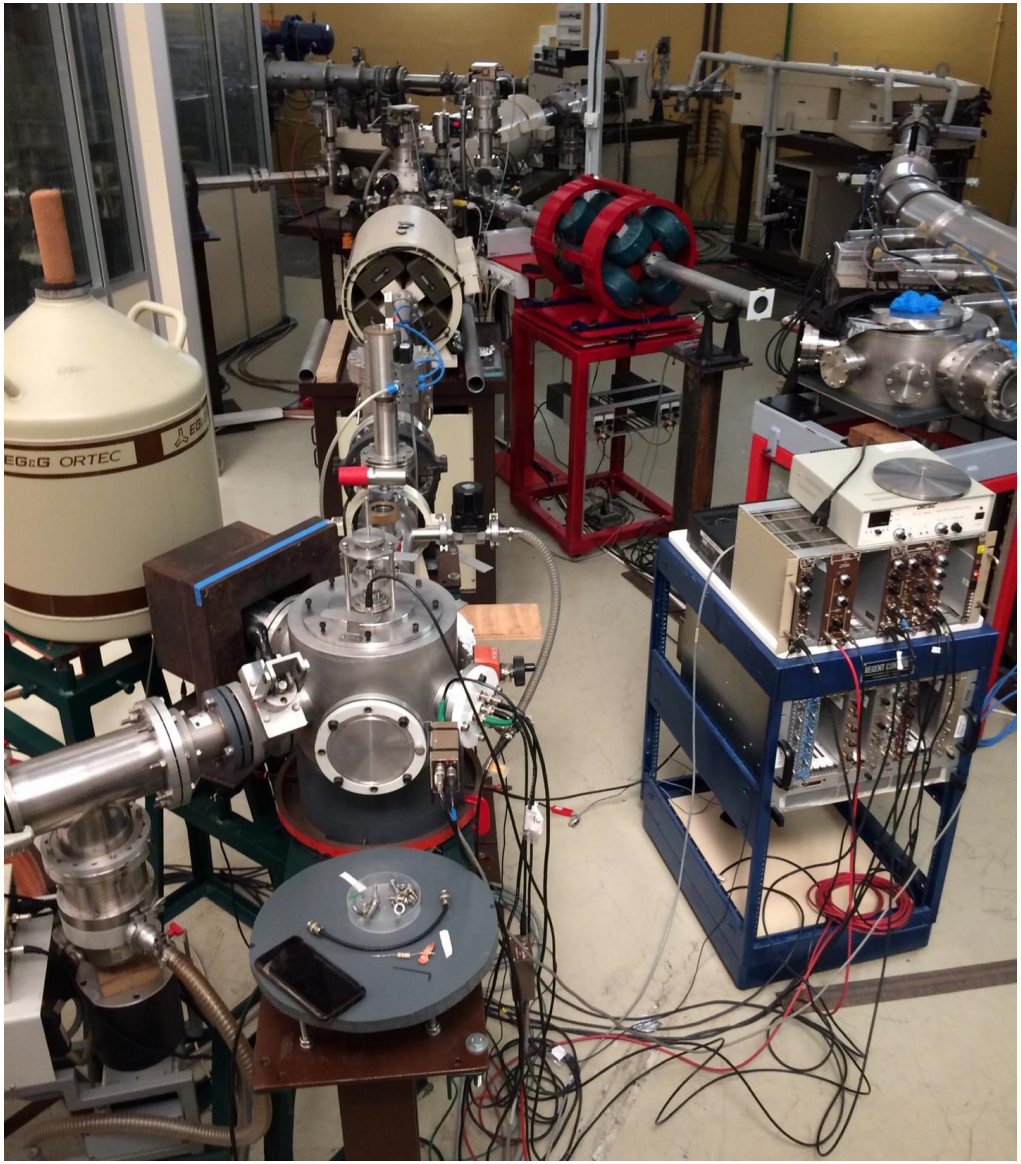
200
400
600
800
1000
1200
1400
1600
1800
500
600
700
800
900
1000

AlfaMC Program[2]

Layer	Thickness (μm)
Ag	0.04
AgCl	2.67
Total	2.71

[2] Luis Peralta and Alina Louro. "AlfaMC: A fast alpha particle transport Monte Carlo code". In: *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment* 737 (2014).

The CTN experiment