Samples to be irradiated at n_TOF and AMS measurements

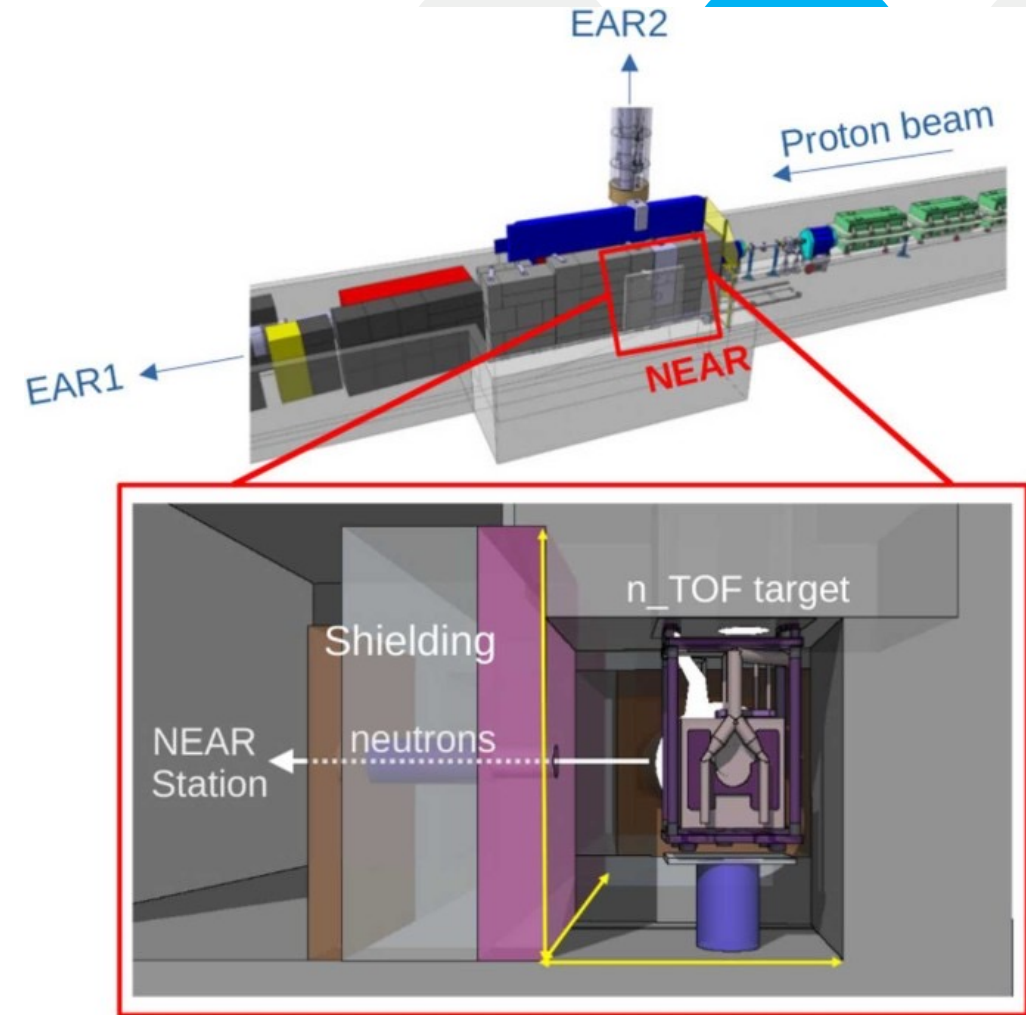Sara Rabaglia – 14/04/2025

Measurement at n_TOF

3 Experimental Area:

- EAR1 (parasitic measurement)

- EAR2 (parasitic measurement)

- NEAR (dedicated measurement)

For each experimental area:

- 1 Sample from Sud Africa (SA) WITHOUT shielding

- 1 Sample from SA WITH shielding of B_4C

- 1 Sample of pure SiO_2 (Goodfellow)

QUESTIONS (1)

When are the samples expected to be available?

For the parasitic measurements, we need to understand the
measurement conditions, and this depends on which
experiment we place our sample irradiation behind. Knowing
when the samples are available is crucial to start planning the
measurement and making arrangements with other
experiments.

QUESTIONS (2)

How much sample material can you send us?
Ideally, we would need around 100 g.

To decide the size of the sample to be irradiated, it is

necessary to know how much material is available. The total

material needs to be divided among the three experimental

areas and the first measurement at AMS

QUESTIONS (3)

In what form will the samples be delivered to us, in terms of granularity, any prior treatments, and other relevant details?

For the sample preparation, it is necessary to know in what form the samples will be delivered. Additionally, for the AMS measurements, it is important to know what chemical treatments the samples have undergone previously.

From previous presentation by Tebogo

QUESTIONS (4)

The expected concentrations in the samples from the SA is on the order of 10^5–10^6, correct?

To reduce the experimental uncertainty, our goal is to

produce, through irradiation, at least one order of magnitude

more than the SA samples of Al and Be.

Sediment from blocks prepared for fossil recovery										
Sample ID	True sample name	N10	σN10	N26	σN26	26Al/10Be	σ26Al/10Be	Age (Ma)	+/- (Ma)	
TM-4	UW105B008	6.39E+05	1.76E+04	1.72E+06	1.28E+05	2.69	0.08	1.75	0.29	1.68
TM-11	UW105B005	5.81E+05	1.41E+04	8.81E+05	1.26E+05	1.52	0.14	2.84	0.58	2.64
TM-13	UW105B002	5.20E+05	1.71E+04	3.95E+05	9.81E+04	0.76	0.25	4.09	1.18	3.52
TM-15	UW105B007	6.40E+05	2.14E+04	1.01E+06	1.97E+05	1.58	0.20	2.74	0.67	2.58
TM-17	UW105B004	5.52E+05	1.52E+04	1.03E+06	1.10E+05	1.87	0.11	2.45	0.44	2.31

Sample ID	True sample name	N10	σN10	N26	σN26	26Al/10Be	σ26Al/10Be			
TM-1	105B1A	7.73E+05	1.90E+04	2.64E+06	1.33E+05	3.41	0.06	1.27	0.20	1.24

QUESTIONS (5) [for AMS]

For the AMS measurement, could it be a problem if the sample has not been irradiated uniformly?

Since in EAR1 and EAR2 the irradiation is parasitic, we do not know with extreme precision where the maximum flux is located, so the idea was to create a target large enough to capture the entire beam, but there will be areas with different irradiation intensities.
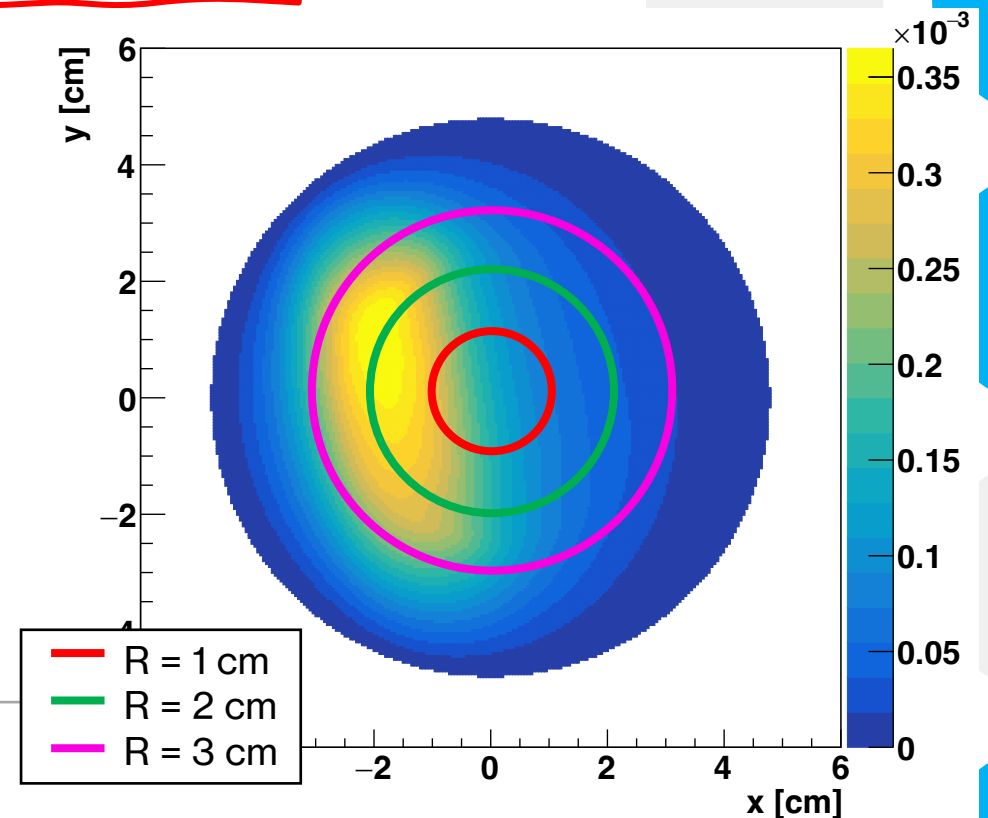
Summary

1. When are the samples expected to be available?

2. How much sample material can you send us? Ideally, we would need around 100 g.

3. In what form will the samples be delivered to us, in terms of granularity, any prior treatments, and other relevant details?

4. The expected concentrations in the samples from the SA is on the order of 10^5–10^6, correct?

5. For the AMS measurement, could it be a problem if the sample has not been irradiated uniformly?